MARINE REVIEW

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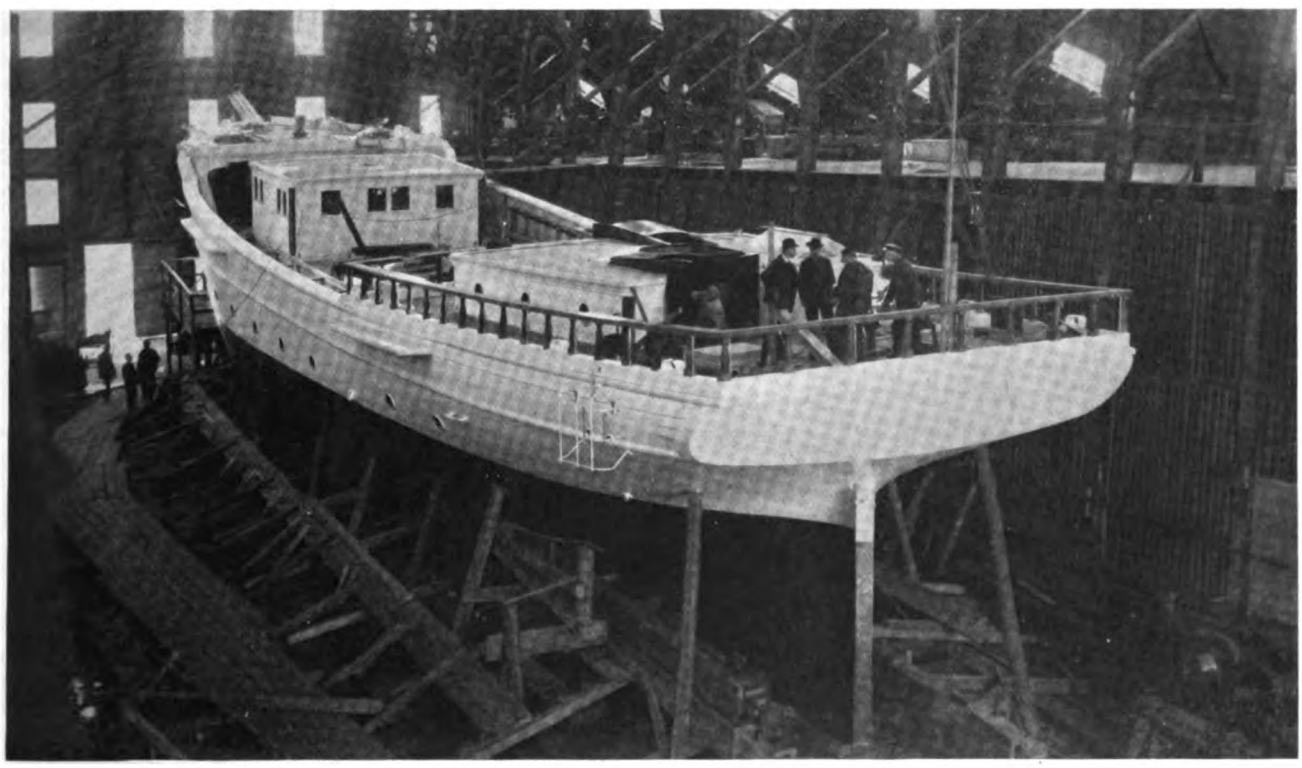
## LAUNCH OF TRAINING SHIP BOXER

The training ship Boxer was launched at the Portsmouth navy yard on Oct. 11 and was named by Miss Helen L. Drury, daughter of Pay Director Hiram E. Drury of the United States navy. Among the guests attending the launch were Senator Henry E. Burnham and Congressman Cyrus Sulloway, Read Admiral Mortimer L. Johnson, retired; Rear Admiral J. M. Miller, retired; and a number of naval officers. After the launch luncheon was served at the residence of Capt. W. W. Mead, commandant of the navy yard. The Boxer was authorized by act of congress March 3, 1903, and is to be used for training landsmen and apprentices. The principal dimensions of the Boxer are: Length on load water line, 180 ft.; length over all, 125 ft. 6 in.; breadth moulded, 29 ft. 5 in.; breadth, extreme to outside of planking, 29 ft. 11 in.; depth top of ceiling to inner side of main deck, 10 ft.; mean draught to bottom of false keel, 9 ft. 6 in.; displacement, 350 tons.

The transverse frames of the vessel are from live oak timber which had been on hand in the timber basin at the Portsmouth navy yard since before the civil war; the keel, keelsons, sister keelsons and that part of the stem and stern framing which is not of live oak are of white oak, most of which also was obtained from the yard timber basin. The outside planking is of yellow pine, from 3 in. to 6 in. thick. The ceiling, which is carried well up beyond the turn of the bilge, and the bulkheads and decks are also of yellow pine; the rails, stanchions, chocks, etc., are of white oak, and the furniture in the officers' quarters is of mahogany and quartered oak. All the fastenings below the water line are of copper and those above of galvanized iron. The vessel is coppered, the top line forming a fair line from 9 ft. 9 in. at



TRAINING SHIP BOXER ON THE STOCKS AT THE PORTSMOUTH NAVY YARD.

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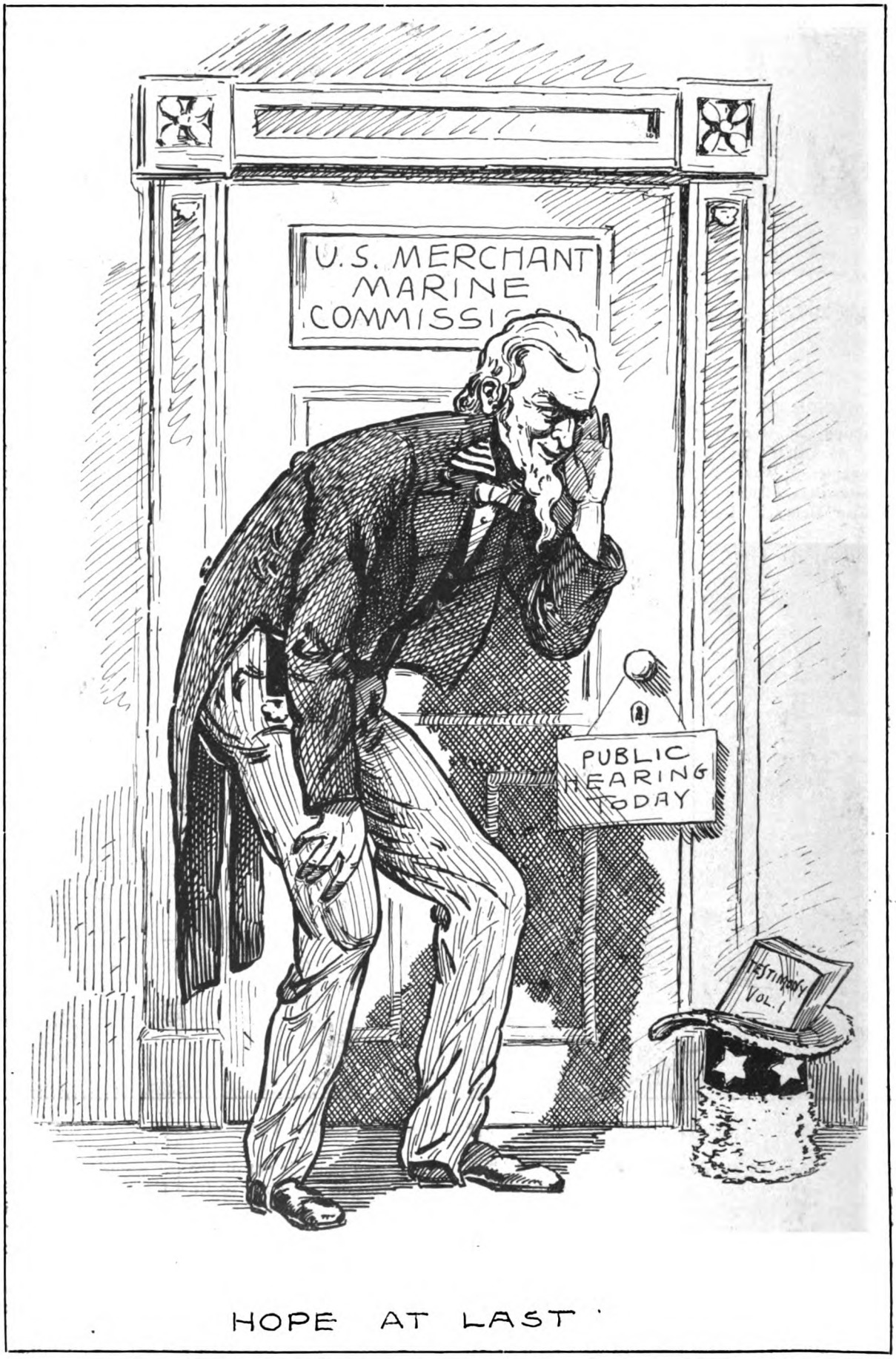
the stem to 10 ft. 9 in. at the stern post; and ¼-in. copper chafing plates are fitted in addition in the wake of the anchor and chain, to prevent damage to the sheathing and under water planking.

The vessel will be furnished with two 1,200-lb. anchors, with ⅞-in. standard chain, to be handled by a hand steel windlass; a hand-power capstan also being on the forecastle deck. A hand screw steering gear is installed aft, and in




HOPE AT LAST

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addition, the rudder stock is fitted with a spare tiller worked by relieving tackles. The vessel is built to carry sixty men and three officers; and will be fitted with davits for carrying one 24-ft. cutter, one 20-ft. whale boat, one 18-ft. dinghy, in addition to two balsas to be carried on the forward deck house. The bowsprit is made from the mainmast of the Reina Mercedes, the mast having been cut off about one foot above the shot hole which was just above the deck, and another shot hole in the bowsprit as made has been plugged.

The foremast is made from the foremast of the Reina Mercedes and the fore topsailyard from the mizzenmast of the Reina Mercedes, the mainmast of the Boxer being from a new stick.

The Boxer is the forty-fifth vessel to be built at the Portsmouth navy yard. She has no steam power of any kind and the hoisting of sails and anchor must be done by hand.

## IMPORTANT TRANSPORTATION DEAL

An important deal has been effected at Baltimore whereby the Weems Steamboat Co. and the Chester River Steamboat Co. have been purchased and consolidated with the Queen Anne's Railroad Co. The consolidated property will be owned by a new corporation to be known as the Maryland, Delaware & Virginia Railway Co. The new corporation will have a bond issue of $2,000,000 which has already been financed. The properties acquired represent transportation lines operating between Baltimore and various points on rivers entering the Chesapeake Bay from both the eastern and western shores of Maryland and Virginia as well as a railroad spanning the Maryland and Delaware peninsula. The purchase of the Weems property and the Chester River property was made for cash. For the Weems property the payment of $1,000,000 was in cash. Especial interest attaches to this transaction as the Weems Steamboat Co. is believed to be the oldest transportation company in the United States, the line having been established in 1817, ten years after Fulton had succeeded in propelling a boat by steam power on the Hudson. The Chester River Steamboat Co. was organized to take over the business of the old Slaughter Line which operated a line of boats in the Chesapeake river in the early fifties. The Queen Anne's Railroad Co. operates a railroad 60 miles long extending through Queenstown, Queen Anne's county, to Lewes, Del. It also has a branch line 20 miles long from Love Point, Queen Anne's county, to Centerville in the same county and crossing the main line at Queenstown junction one mile east of Queenstown.

## BATTLESHIP OHIO IN COMMISSION

On Tuesday morning, Oct. 4, the new battleship Ohio was towed from the Union Iron Works and anchored in the bay of San Francisco. At noon Capt. N. C. Logan and her officers and crew came aboard. The captain read his orders from the secretary of the navy and the silk ensign presented by the Ohio society was run up. Capt. Logan is a native of Ohio and graduated from Annapolis in 1867. His rank dates from July 11, 1902, and he stands 49th on the list of eighty-two captains. The other officers are: Lieut. Com. W. D. Buchanan (of Ohio), graduated from Annapolis in 1882; Lieut. Com. M. A. Anderson (of Wisconsin), chief engineer; Lieuts. J. S. McKean (Ohio), C. M. Stone (Indiana), E. T. Pollock (Ohio), Arthur McArthur, Jr. (Wisconsin), N. L. Jones (Mississippi), and Clarence S. Kempff (California); Ensigns S. F. Whitten (New Mexico), and J. H. Blackburn (Massachusetts); Midshipmen S. M. Robinson (Texas), C. C. Moses (Alabama), M. K. Metcalf (California), and A. Claude (Maryland); Surgeon W. C. Braisted (Michigan); Paymaster J. Brooks (Massachusetts); Captain of Marines J. T. Bootes (Delaware); Boatswain A. R. Nickerson; Chief Gunner Simon Jacobs; Electrician Gunner O. E. Reh; Carpenter W. W. Toles and Warrant Machinists E. A. Blackwell, A. T. Percival, W. J. Powell and J. W. Murray.

The Ohio is the fourteenth modern battleship commissioned in the United States navy and is a sister ship of the Maine and Missouri.

## SUMMARY OF NAVAL CONSTRUCTION

The monthly summary of naval construction, issued by the bureau of construction and repair of the navy department, shows the customary progress upon all naval vessels. Both the battleships Louisiana and Connecticut have now been launched and the Louisiana is shown as maintaining a lead of 6 per cent over the Connecticut. Following is the summary:

| | | Degree of completion, per cent. Sept. 1,'04. | Oct. 1,'04 |
|---|---|---|---|
| **Battleships.** | | | |
| Ohio | Union Iron Works. | 99. | 99.7 |
| Virginia | Newport News Company. | 66.8 | 68.6 |
| Nebraska | Moran Bros. Company. | 56.7 | 59. |
| Georgia | Bath Iron Works. | 63.3 | 65.3 |
| New Jersey | Fore River Shipbuilding Co. | 66.4 | 69.1 |
| Rhode Island | Fore River Shipbuilding Co. | 68.9 | 71.2 |
| Connecticut | Navy Yard, New York. | 50. | 53.59 |
| Louisiana | Newport News Company. | 56.5 | 59.08 |
| Vermont | Fore River Shipbuilding Co. | 16.3 | 21.5 |
| Kansas | New York S. B. Co. | 22.1 | 26.6 |
| Minnesota | Newport News Company. | 39.77 | 43.8 |
| Mississippi | Wm. Cramp & Sons. | 7.71 | 10.24 |
| Idaho | Wm. Cramp & Sons. | 7.47 | 9.98 |
| **Armored Cruisers.** | | | |
| Pennsylvania | Wm. Cramp & Sons. | 86.7 | 90.5 |
| West Virginia | Newport News Company. | 91.62 | 94.2 |
| California | Union Iron Works. | 63. | 64. |
| Colorado | Wm. Cramp & Sons. | 91.2 | 95. |
| Maryland | Newport News Company. | 89.16 | 90.57 |
| South Dakota | Union Iron Works. | 61. | 61.5 |
| Tennessee | Wm. Cramp & Sons. | 45.74 | 50.06 |
| Washington | New York Shipbuilding Co. | 41.4 | 44.7 |
| **Protected Cruisers.** | | | |
| Chattanooga | Lewis Nixon. | 94.02 | 97. |
| Galveston | Wm. R. Trigg Co. | 89. | 91. |
| St. Louis | Neafie & Levy Company. | 48.8 | 51.1 |
| Milwaukee | Union Iron Works. | 57. | 58.5 |
| Charleston | Newport News Company. | 81.4 | 83.2 |
| **Gunboats.** | | | |
| Dubuque | Gas Engine & Power Co. | 58.4 | 63.9 |
| Paducah | Gas Engine & Power Co. | 53.6 | 58.9 |
| **Training Ships.** | | | |
| Cumberland | Navy Yard, Boston. | 66. | 72. |
| Intrepid | Navy Yard, Mare Island. | 49.1 | 56.2 |
| **Training Brig.** | | | |
| Boxer | Navy Yard, Portsmouth. | 75. | 85. |
| **Torpedo Boats.** | | | |
| Stringham | Harlan & Hollingsworth Co. | 99. | 99. |
| Goldsborough | Wolff & Zwicker. | 99. | 99. |
| Blakely | Geo. Lawley & Sons. | 99. | 99. |
| Nicholson | Lewis Nixon. | 99. | 99. |
| O'Brien | Lewis Nixon. | 98. | 98. |

The Panama Canal Commission has opened bids for eleven steam shovels for use on the Culebra cut. Five of the shovels are of 70 tons each and six of 90 tons each. Great interest attaches to the proposals because the terms of the bid include dismantling, packing, shipping and erecting. The bidders were the Bucyrus Co., Milwaukee, Wis.; the Vulcan Iron Works, Toledo, O.; the Atlantic Equipment Co., New York; the Marion Steam Shovel Co., Marion, O.

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## LAUNCH OF BATTLESHIP NEBRASKA

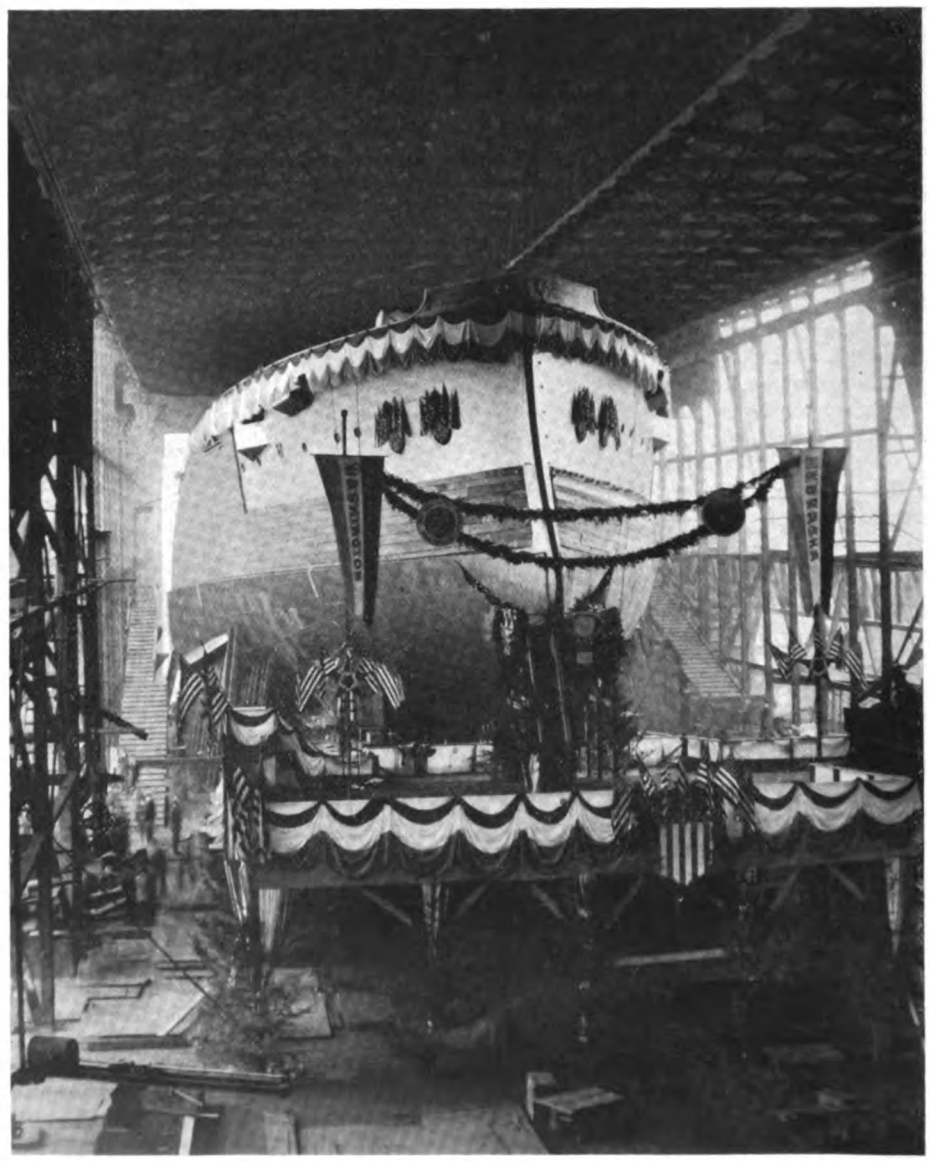
MISS MARY NAIN MICKEY.

It was related in last week's Review that the battleship Nebraska would be noted among vessels of the United States navy as the ship that launched herself. Notwithstanding this departure from the accepted program the launch of the Nebraska at the yard of Moran Bros. Co., Seattle, Wash., was successful in every way. The Nebraska is the first battleship to be built north of San Francisco on the Pacific coast and it may be said that the whole state of Washington was intensely interested in the event. The Nebraska was christened by Miss Mary Nain Mickey, daughter of Gov. John H. Mickey of Washington, and it is sufficient evidence of her presence of mind to say that she succeeded in breaking the bottle of champagne and christening the vessel before it got out of her reach. Anyone who knows how quickly a ship gets beyond reach of the launching stand even when sufficient notification is given to the sponsor will appreciate this performance on the part of Miss Mickey.

Gov. Mickey had made his address, President Schram of the Chamber of Commerce of Seattle had given a certified check for $100,000 to Moran Bros. Co. as the contribution of the city of Seattle to the ship builders to equalize the difference in cost which exists, owing to freight charges between the building of a ship on the Pacific coast and the Atlantic coast; Secretary Meikle of the Chamber of Commerce had spoken; Attorney General Prout had said a few words and Congressman Humphrey was in the midst of his address when the Nebraska, as though impatient at so much ceremony, broke her way from her fastenings and plunged into the water. At this supreme moment a perfect bedlam of noise was made by the thousands upon thousands of persons assembled, assisted by craft of all kinds in the harbor. Needless to say everyone breathed a sigh of relief when it was learned that the ship entered her native element without injuring herself or anyone else.

At the time of launching, the percentage of completion of all work pertaining to the hull, ordnance, and equipment was 59.4 per cent; the machinery on the same date was 79 per cent completed. All structural work below the protected deck, and practically all structural work to the upper deck, was completed and riveted. About two-thirds of the stanchions were in place. Most of the watertight doors were fitted in place. All manholes in the inner bottom were fitted and bolted down during the launching. All sea-connections were completed. The rudder was in place and held rigidly amidships with clamp timbers. Both tail-shaft and the propeller hubs were in place. The main drain was completed, the secondary drains nearly completed. All air ports were fitted in place. Bulkhead armor of casemate, tubes and barbette armor for 8-in. broadside turrets, conning-tower tube, signal tube, splinter-bulkheads, and gun protection were in place and practically completed. All teak backing was fitted.

All compartments adjacent to shell plating had been tested, and the entire testing of the watertightness of the ship was over one-half completed. The boilers and uptakes were installed complete.



VIEW OF THE BATTLESHIP FROM THE LAUNCHING STAND.

The electric generators, air-pumps, circulating pumps, condensers, feed-pumps, blowers, anchor windlass, ice-machine and work shop machinery were installed.

The weight of the ship at the launching was 6,550 tons, as follows: hull, 4,629 tons; armor, 305 tons; splinter bulkheads, 83 tons; protective deck, nickel steel, 242 tons; wood—backing and gun foundations, 143 tons; paint and cement, 66 tons; auxiliaries, 29 tons; piping, valves, and hull fittings, 110 tons; equipment (electric), 53 tons; machinery weights, 805 tons; miscellaneous and foreign weights, 85 tons; total, 6,550 tons.

The building slip was perpendicular to the shore

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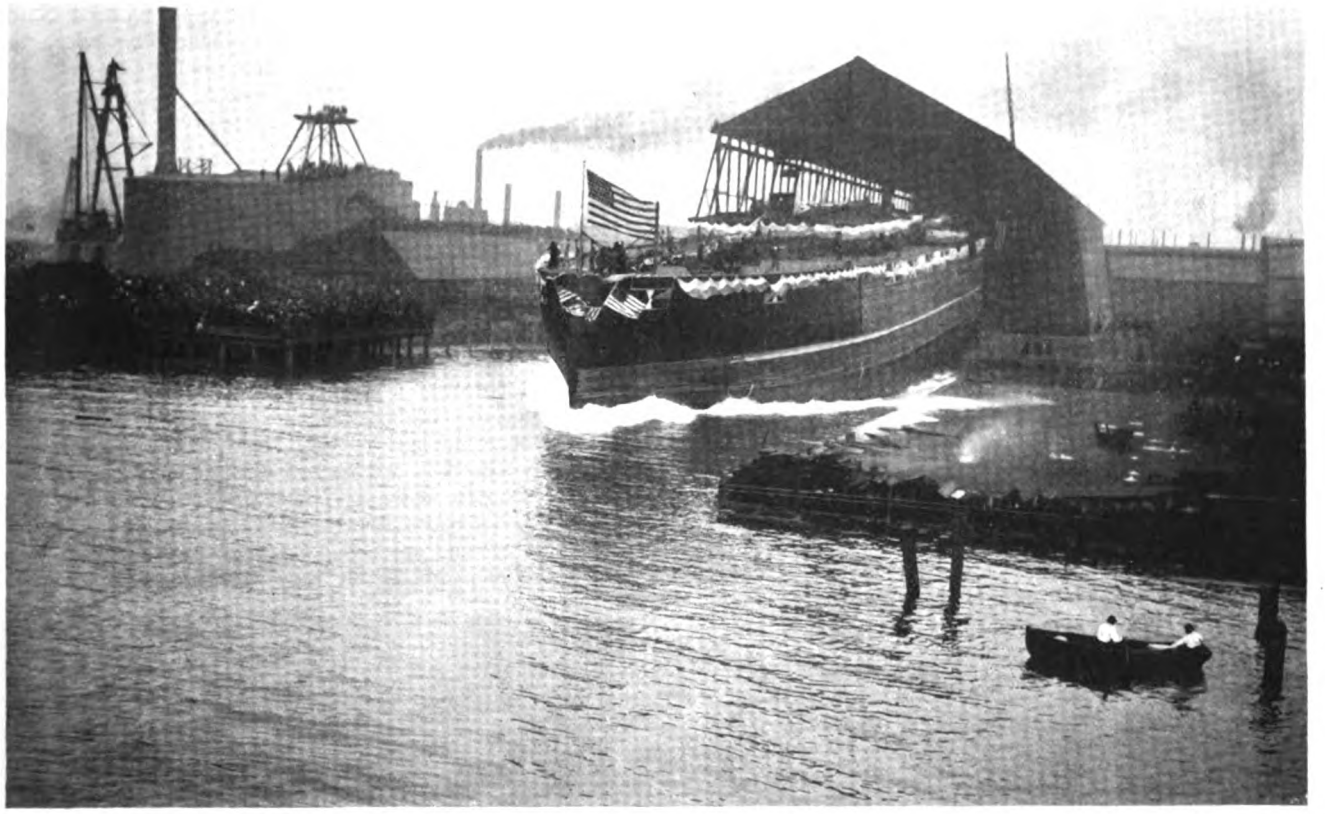

THE NEBRASKA TAKING TO THE WATER JUST ELEVEN MINUTES AHEAD OF TIME.

line and no attempt was made to stop the ship after launching. The cradle consisted of the usual solid packing throughout the greater portion of its length, with nine poppets forward on each side and fourteen poppets aft on each side.

Five pairs of poppets forward and seven poppets aft were secured together across the keel by steel plates ¾ in. and 7-16 in. thick and 16 in. wide. These plates carried angle clips hooking against the plate laps and anchored in the poppet clamp-timbers by means of angle-bars and hardwood wedges to bring an initial strain upon the plates.

In order to distribute the strain of pivoting ten crushing pieces 9 in. deep and of thickness gradually increasing from the fore poppets were fitted between the sliding ways and the poppet shoe-timbers on each side; which effectively prevented the concentration of load at the forward end of the sliding ways at the point of pivoting.

In addition, a steel plate shoe 40 ft. long and 42 in. wide of ⅜-in. steel was worked on the under side of the sliding ways at the extreme forward end, or over the same length as the crushing pieces; to prevent the "freezing" of the sliding ways to the ground ways due to extraordinary pressure at the pivoting point.

The sliding ways and the ground ways were secured together at the head of the ways by means of ⅞-in. through bolts passing through steel plate 7-16 in. thick on top and bottom. Between the ways was inserted a key of oak just forward of the saw-cut. The area of cross section of saw cut for one side was 420 square inches.

To assist in starting the ship in case it should be necessary hydraulic jacks were located at the head of the ground ways having a capacity of 100 tons for each side. These were butted against fir timbers securely bolted to the ground ways. It was not necessary to use the jacks for starting the vessel. A row of incandescent lights were strung inside of the ground ways on each side.

During its construction, the packing was supported by distance pieces 2 in. by 4 in. by 46 in. which separated it from the sliding ways until the day before the launching when these pieces were replaced by fir wedges. Under the poppets these wedges were 7 ft. long and 9 in. wide and under the solid packing 6 in. wide, all being 6 in. thick tapering to ⅛ in. There were ninety-two wedges under the poppets both sides and 340 wedges under the solid packing. For wedging up, sixteen battering rams were used, eight on each side.

The total length of the ground ways from the sawing off station was 482 ft. 6 in. of which 172 ft. 6 in. were under water. The spread of the ways between the inner faces of the ribbands was 30 ft. 8½ in., the ways being parallel, with camber or transverse inclination. The ground ways were inclined 72-100 in. per foot throughout their length and were supported by piling their entire length, the transverse cap-timbers being left off 16 ft. from the end of the ways.

The depth of the water over the end of the ground ways was 9 ft. 8¼ in. at the time of the launching. The total length of the sliding ways from the sawing off station was 359 ft. 6 in.

The lower ends of the ground ways, from the mark of high water or about 175 ft., were sheathed with 3-in. stuff just before applying the grease. This was to prevent the timber receiving the grease from becoming water soaked and filled with dirt from the tide.

The grease used was applied on the ways Sept. 18. There were used; tallow, 1,950 lbs.; stearine, 1,890 lbs.; whale oil soap, 986 lbs.; and the day before the launch the lower end of

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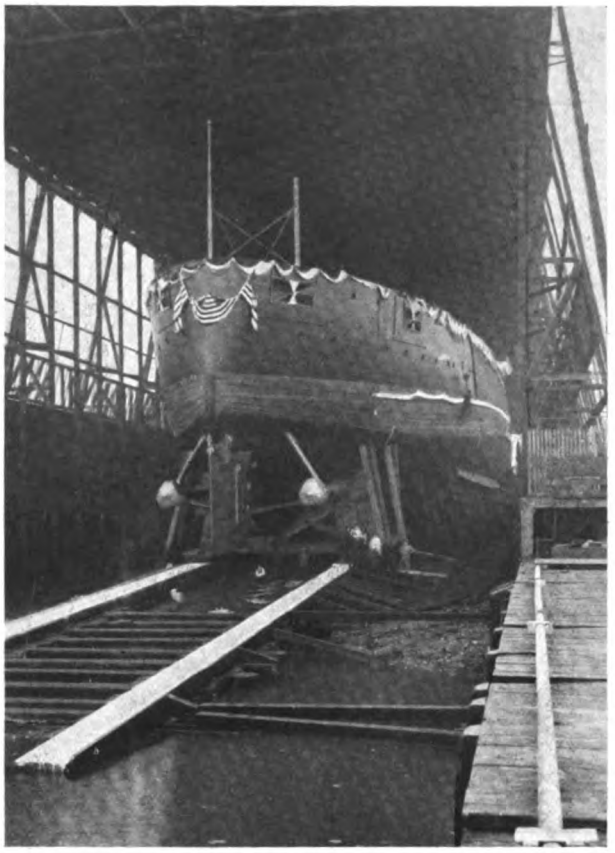
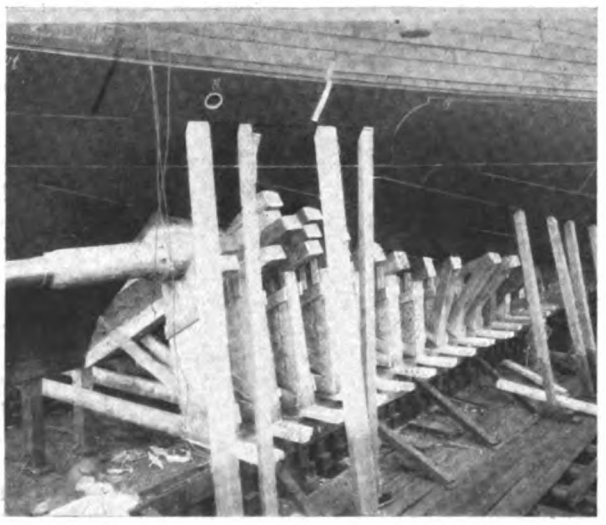
the ways were greased with 500 lbs. of tallow and 450 lbs. of stearine, making a total of 5,776 lbs. of grease used. The first application was pure stearine; then a mixture of 60 per cent tallow and 40 per cent stearine and finally a coat of



STERN VIEW OF THE NEBRASKA ON THE WAYS

whale oil soap. A clearance of ⅝ in. on each side between the ribbands and the sliding ways was maintained by distance pieces and covered with a thin batten to protect the grease from dirt. To take the weight off from the grease



JUST PRIOR TO THE LAUNCH.

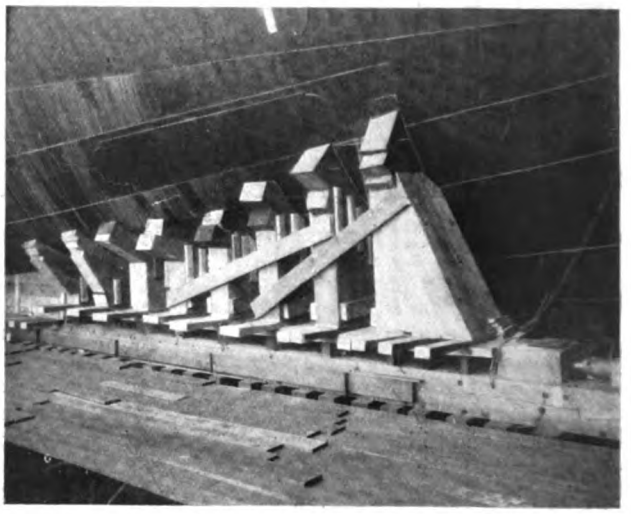
before wedging, distance pieces ⅝ in. thick, 6 in. wide and 46 in. long were inserted about 10 ft. apart..

When the ship was launched there was no smoking of the ways, and the grease was left almost intact; about 4,000 lbs. of grease were removed from the ways the day after the launch.

On Oct. 6, the day before the launch, the ship was supported as follows: Between the keel and the ground ways, and for a length of 308 ft. was a line of shores spaced 4 ft. apart. Fifteen feet outboard of the ground ways was a line of shores extending 300 ft. forward and aft and similarly spaced. Twenty-three feet outboard of the ground ways was a third line of shores extending 312 ft. and similarly spaced. Total shores: Row A, 78; row B, 66; row C, 69; total 213; total both sides: 426 shores. Besides there were four cribs under each docking keel.

Over the line of the launching ways in the forward end of the ship and in the wake of the forward poppets, were worked shores from the second longitudinals to the lower platform and between the lower and upper platform decks, heading against stanchions and beams; these were to distribute the strain on the fore poppets in pivoting and prevent distortion of the framing in their wake. In each fire room were two shores extending from the inner bottom to the protective deck to prevent the structural distortion of the double bottom due to wedging.

On Sept. 23 the keel blocks at the after end of the ship, for a distance of 68 ft. were removed and replaced by tripping shores. On Oct. 4 the keel blocks in wake of the forward poppets were removed. On Oct. 5 the distance pieces between the ground ways and the sliding ways were removed, allowing the weight of the ways to come on the grease.



READY TO RELEASE HER.

On the day of the launch, Oct. 7, the following program was carried out:

| | |
|---|---|
| 7:30 A. M. | Greased outer end of ways. |
| 10:50 A. M. | Wedges rammed up aft 40 ft.; 10 minutes. |
| 11:17 A. M. | Wedges rammed up aft second wedging; 18 minutes. |
| 11:45 A. M. | Began removing shores Row A. |
| 11:50 A. M. | Wedges rammed up over remainder of length; 18 minutes. |
| 12:10 P. M. | Began removing keel blocks from aft. |
| 12:35 P. M. | Row A shores removed. |
| 12:45 P. M. | Cribbing under docking keels cut. |
| 1:05 P. M. | All keel blocks removed. |
| 1:15 P. M. | Began removing shores in rows B and C from aft. |
| 1:35 P. M. | All shores removed. |
| 1:49 P. M. | Began removing cribbing under docking keels. |
| 1:58 P. M. | Began sawing sole pieces. |
| 1:59 P. M. | Sole pieces almost sawed through; ship broke away and started quickly down the ways. |

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GENERAL DATA.

| | |
|---|---|
| Launched | Oct. 7, 1904 |
| Length over all | 441 ft. 3 in. |
| Breadth extreme | 76 ft. 2½ in. |
| Depth moulded | 41 ft. 4¼ in. |
| Percentage completion | 59.4 per cent |

Times:

| | |
|---|---|
| Started to ram up | 10:50 A. M. |
| Finished ramming up | 12:08 P. M. |
| Started to remove shores | 11:45 A. M. |
| Finished removing shores | 1:35 P. M. |
| Started to remove keel blocks | 12:10 P. M. |
| Finished removing keel blocks | 1:05 P. M. |
| Started to remove cribbing | 1:49 P. M. |
| Finished removing cribbing | 1:58 P. M. |
| Ship launched | 1:59 P. M. |

| | |
|---|---|
| Men employed on ship | 46 |
| Men employed on slip | 192 |
| Temperature of air | 59 degrees. |
| Sawing station aft of fore perpendicular | 36 ft. 6 in. |
| Length of ground ways | 482 ft. 6 in. |
| Length beyond sliding ways | 123 ft. 0 in. |
| Length of ground ways beyond knuckle of keel, lowest point | 118 ft. 9 in. |
| Inclination of ways, uniform | 72-100 in. per ft. |
| Inclination of building slip | ¾ in. per ft. |
| Inclination transversely | None |
| Camber | None |
| Inclination of ship | 5/8 in. per ft. |
| Spread of ground ways between ribbands | 30 ft. 8½ in. |
| Length of sliding ways | 359 ft. 6 in. |
| Width of sliding ways | 42 in. |
| Thickness of sliding ways | 10 in. |
| Area of sliding ways | 2,516.5 sq. ft. |
| Depth of water at end of ways | 9 ft. 8 in. |
| Elevation of after knuckle above M. H. W. | 1.95 ft. |
| Launching weight of ship | 6,465 tons |
| Launching weight of dunnage and shoring | 85 tons |
| Weight of cradle | 169 tons |
| Total launching weight | 6,719 tons |
| Pressure on ways per square ft. | 2.67 tons |
| Draught forward | 11 ft. 3 in. |
| Draught aft | 12 ft. 6 in. |
| Mean draught | 11 ft. 10½ in. |
| Hogging after launching | ¼ in. |
| Pressure on fore poppets at pivoting | 1,644 tons |

Lubricant:

| | |
|---|---|
| Stearine | 2,350 lbs. |
| Tallow | 2,450 lbs. |
| Whale oil soap | 986 lbs. |

| | |
|---|---|
| Time of starting to maximum velocity | 23 seconds |
| Maximum velocity, knots per hour | 12 |
| Distance traveled to maximum velocity | 224 ft. |
| Coefficient of friction initial | .046 |
| Distance traveled to pivoting point | 335 ft. |

## VESSEL LOSSES DURING 1903

The statistical summary of vessels of all nations totally lost or condemned during 1903 has just been issued by Lloyd's Register of Shipping. The table shows that during 1903, 237 steamers of 298,376 gross tons were foundered, wrecked or lost during the year. To this wastage is to be added 498 sailing vessels of 259,004 tons. Of these losses combined, Britain as usual, owing to the preponderence of her tonnage, is the greatest sufferer. She lost 155 vessels of 193,200 tons. The British colonies lost forty-one vessels of 18,192 tons. Norway comes next with a wastage of 125 vessels of 86,736 tons. The United States comes third with a wastage of 100 vessels of 66,797 tons, exclusive of the losses on the great lakes. Others were as follows: Austria Hungary, eight vessels of 14,544 tons; Denmark, nineteen vessels of 7,415 tons; Holland, thirteen vessels of 9,054 tons; France, thirty-six vessels of 34,779 tons; Germany, thirty-nine vessels of 32,520 tons; Italy, twenty-seven vessels of 16,412 tons; Russia, twenty-two vessels of 8,312 tons; Spain, eleven vessels of 9,349 tons; Sweden, 66 vessels of 27,437 tons.

## LAUNCHING OF THE TRAINING SHIP INTREPID

At 12:11 P. M. on Saturday, Oct. 8, the new training ship Intrepid was launched at the Mare Island navy yard in the presence of the workmen who built her, sailors and marines of the United States navy, and a large crowd of the citizens of Vallejo. United States Senator George C. Perkins, senior member of the naval committee of the senate, was introduced by Rear-Admiral McCalla and made a good speech. In the course of his remarks he referred to the fact that Rear-Admiral B. H. McCalla, commandant of the navy yard, commanded the sailors and marines detached from the American warships on the Asiatic station for the defense of the legations at Peking in May, 1900.

The Intrepid was christened by Miss Helen de Young, daughter of Mr. H. de Young, proprietor of the San Francisco Chronicle. She entered the water amid the screeching of steam whistles and booming of artillery.

The new vessel is of steel and will be a sailing ship, bark-rigged. Her dimensions are: Length, 176 ft. 5 in.; beam, 45 ft. 7¾ in.; mean draught, 16 ft. 5¼ in.; displacement, 1,800 tons. She will have a battery of six 4-inch 40-caliber rapid-fire guns, four 6-pounder rapid-fire guns, two 1-pounder rapid-fire guns and two Colt automatic guns. She will have an engine for supplying light and power for two condensers, the pumps, the capstan and windlasses. She will carry her commander, nine wardroom officers, six warrant officers and 320 men.

The Intrepid is the third vessel of that name in the United States navy. The first was a Tripolitan ketch named Mastico, captured in 1803 by Lieut. (afterwards Commodore) Decatur, commanding the schooner Enterprise in the war against the pirates of the Mediterranean sea. The United States frigate Philadelphia had run upon a reef while pursuing a blockade runner. That she might not become one of the Tripolitan fleet, Lieut. Decatur entered the harbor with the Mastico and destroyed the frigate.

The second Intrepid was an armored ram steamer, but accomplished nothing of note.

The first rivet in the keel of the third Intrepid was driven on Jan. 2 of this year by Capt. B. H. McCalla, P. B. Lynch (mayor of Vallejo) and F. R. Devlin, president of the Chamber of Commerce.

## NEW GOVERNOR OF TUTUILA

Com'd C. B. T. Moore, head of the equipment department of the Mare Island navy yard, California, is likely to be assigned to the post of governor of Tutuila, Samoan islands. Comdr. Edward B. Underwood, now in command of the United States steamer Adams at Tutuila, has been the governor for the past two years, but will probably be relieved and ordered home before the end of 1904. It is likely that Comdr. Underwood, on his return, will become head of the equipment department when vacated by Comdr. Moore.

The Rogers Engineering Co. of 109-111 New Montgomery street, San Francisco, has nearly ready for launching an auto-boat of the latest type in vogue in the eastern states. She is equipped with a 20 H. P. Buffalo engine and will be added to the fleet of the San Francisco Yacht Club, with headquarters at Sausalito, Marin county.

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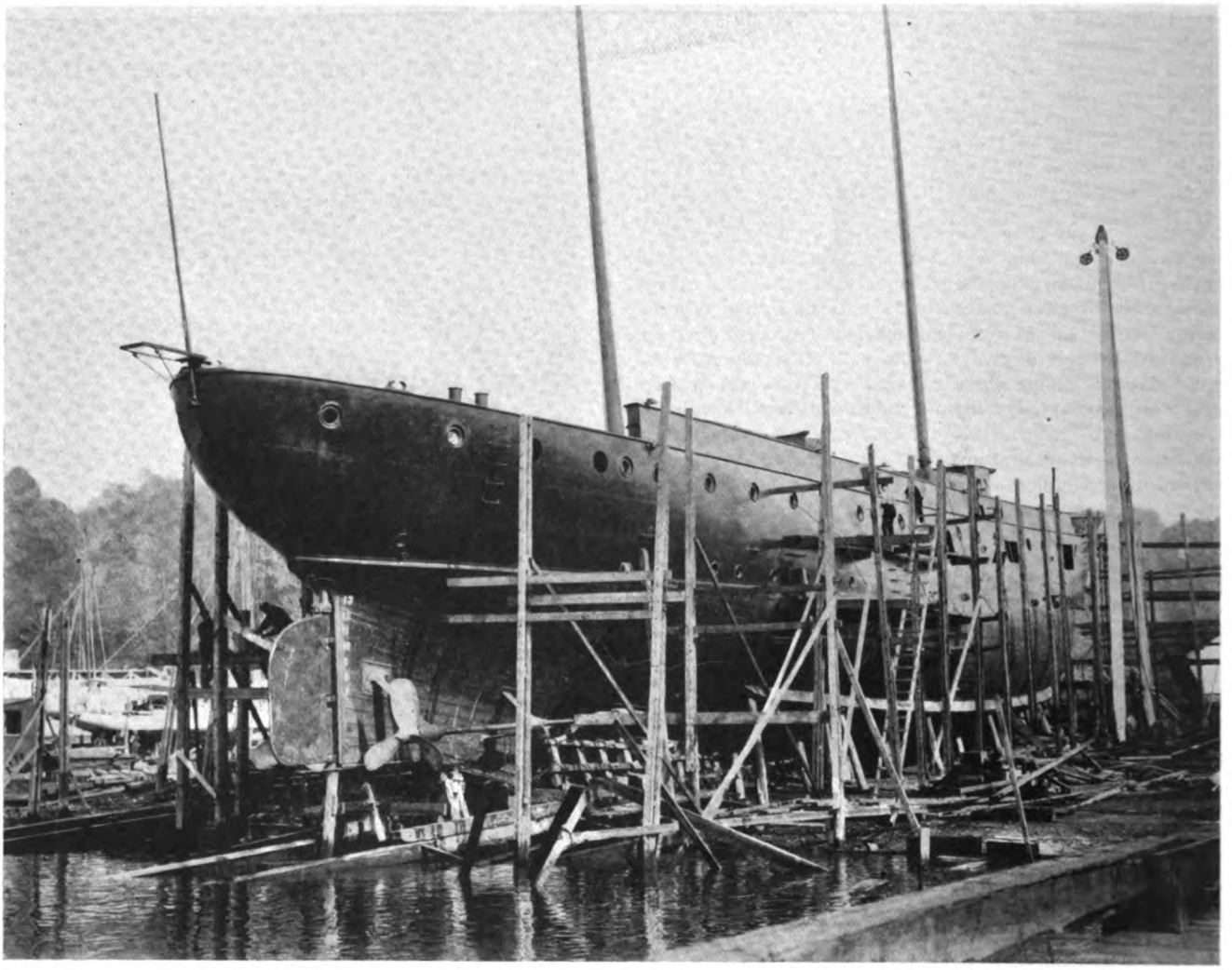
## LAUNCH OF GUNBOAT PADUCAH

The United States gunboat Paducah was successfully launched from the yard of the Gas Engine & Power Co., & Charles L. Seabury & Co., Consolidated, Morris Heights, New York, last week. The sponsor was Miss Anna Yieser, daughter of Mayor D. A. Yieser of Paducah, Ky., and she was assisted by her sister Florence. The Paducah with her sister the Dubuque was authorized to be built for special service in Central and South American waters. The Dubuque, which was also built by the Gas Engine & Power Co., was launched some time ago. Both vessels are 174 ft. long, 35 ft. beam and have a draught of 12 ft. 3 in. Their armament consists of six 4-in. rapid-fire guns, four 6-pounder guns and two 1-pounder guns and two Colt automatic guns.



GUNBOAT PADUCAH ON THE STOCKS JUST BEFORE THE LAUNCH.

*[Building by the Gas Engine & Power Co., and Charles L. Seabury & Co., Morris Heights, N. Y.*

## MINEOLA SUNK OFF COAST OF KAMSCHATKA

News has been received in San Francisco of the total loss off the Kamschatkan coast of the steamer Mineola, well-known in that port. She was a steel vessel, built at Sunderland, England, in 1888 and bought by C. P. Huntington for use on the Pacific coast in 1893. She was 275 ft. long, 28 ft. beam and 19 ft. deep. She had recently undergone extensive repairs and been provided with new boilers. She had a speed of 12 knots. Her value was $200,000. She was owned by the Pacific Improvement Co. and used to carry coal from Tacoma to San Francisco.

She was chartered by Roth, Blum & Co. to carry general merchandise to Siberia and bring back furs. She sailed from the port of San Francisco on June 27 with a cargo valued at $80,000, and while returning from Northern Siberia ports, ran on an uncharted rock near Tigel Bar on Sept. 5. She struck with great force and began to fill. Capt. Alexander Kirkwood ordered all hands into the boats, and, soon after the boats got clear, the vessel slid off the rock and foundered in deep water. The boats made for the shore of Kamschatka and were picked up by the British war vessel Algerine, which landed all the survivors at Hakodate. The Mineola had two more Siberian ports to call at before starting for San Francisco. Capt. Kirkwood is an experienced and skillful navigator and it is believed that he was not to blame for the loss of the vessel, which he knew was liable to capture by a Japanese warship. It is supposed that she eluded the Japanese cruisers and reached Vladivostok; and that on her way home she was hugging the shore so as to dodge any vessels that might pursue her. She was carrying mail, furs, a general cargo and a large quantity of coal. She was fully insured.

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The Jackson & Sharp plant of the American Car & Foundry Co., Wilmington, Del., has been awarded the contract to make extensive repairs on the steamer Alaska of the American Fisheries Co., Providence, R. I., including lengthening her 24 ft.

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## SCRAPPING SMALL STEAMERS

Buffalo, Oct. 18.—"What are the ship yards going to do now with all the monster new steamers they have under contract?" was asked of an old vessel owner who made a great part of his holding in a schooner that carried not more than 1,500 tons. He replied readily enough that the plan was evidently to drive the present middle-sized vessels out of business and it would do it easily enough. They are pretty well cornered now. Passing over to the package-freight liners, which forms Buffalo's lead in the lake business, it is found that the big companies there represented are engaged in doing that very same thing with their own boats and calling it good business. Both the New York Central and Pennsylvania lines are putting on new heavy carriers and leaving their smaller liners tied up to the dock and they do not hesitate to say that the move is more profitable to them than to keep the small boats running and doing what they can till they are worn out or lost.

Of course the superannuating of the small craft always gives occasion for the glib talker to say wise but very uncharitable things, and such people are now engaged in saying that it will be the policy to get a good insurance on this class of craft and then let the storms rage. If they fail to weather them it is a good sale. Sometimes the insurance companies are rather gifted in that sort of forecast also and they put up their rates or decline such risks just as though they were sure of their facts.

Well, the package-freight companies are not doing that, though, for they are for the most part letting their small steamers remain tied to the dock all summer, some of them not having been out this season. The showing, according to one of the managers, is this: The line had vessels enough to do all its business this season, even if it had been good instead of poor, but it built a steamer that would do the business of three small ones and made it pay to use her and hold the three out of commission. The fact is she can be run for about the same cost as one of the smaller ones and if it happened, as it occasionally has, that she must come down with a cargo of 2,000 tons there was not much loss as compared with the business of one of the three small ones and when she took a cargo of 5,000 tons there was a decided profit.

So the plan is to convert the package-freight liners into large carriers at the convenience of the owners, without any regard to the fact that existing boats, some of them their own, are driven out of business. This is another evidence that the American business man knows the value of the scrap heap better than some of his neighbors and though big losses are sustained in that way they stand right alongside of big earnings that put the balance on the profit side. The lines will be obliged to maintain some of their smaller steamers, as it is not possible to use the large ones everywhere, especially in certain parts of Chicago harbor, which is now the least navigable of any of the larger lake ports. Just as fast as the big steamers can be handled in the ports that need them they will be put on. It is not thought, though, that their size will be made any larger than at present, as there is some doubt as to the future of that class of traffic.

It was a rather hard blow to the flour carriers when the Interstate Commerce Commission took up the matter of free flour storage and handling in the lake warehouses in Buffalo, for the northwestern millers did not think they could afford to pay storage and they set at work to bring the all-rail lines to their way of thinking by sending east solid train loads of flour that did not break up till they reached the Niagara frontier and were ready to be distributed over the territory east of that. The lake lines lost a large amount of business by that move and Buffalo is getting much less flour by lake in proportion to the business done than she did before free storage was cut off.

There seems to be a fair amount of faith in the future of the line traffic on the lakes and the late history of the Erie canal seems to warrant it. This has been a hard year for all classes of grain carriers and the canal has suffered with the rest, but for all that it is going to make a very fair showing, both as to amount carried and earnings, on account of the demand for west-bound tonnage. It is remarkable how much there has been of this, as well as of purely local business all summer. This is mainly on account of the slower and slower service by rail every year and the failure of the roads to keep cars sufficient to meet the wants of shippers. It appears that they do not think it pays them to be prompt, so the water route will remain the popular one for all that it can do.

JOHN CHAMBERLAIN.

## OBITUARY

A. C. Archibald, one of the younger figures in the life of Winnipeg, died this month. Mr. Archibald went to Winnipeg fifteen years ago from Nova Scotia and entered the service of the Commercial Bank of Manitoba. Ten years ago he left the bank to engage in the vessel and marine insurance business. As the export grain trade grew his business flourished proportionately and he took quite a place among Winnipeg's foremost successful business men. He was married in 1896 to Miss Maud Mair of Lanark, Ont.

Frank W. Ofeldt, the inventor of the naphtha launch, who died recently in Brooklyn, N. Y., was a remarkable man in many ways. He was born in Sweden in 1836 and came to this country when he was thirty years old. His inability to speak English handicapped him at first so that it was necessary for him to accept a position as a day laborer. Later he obtained work in a machine shop in Newark, N. J., and while there he conceived the idea of generating illuminating gas from gasoline and invented a machine for its manufacture. A company, known as the Star Gas Machine Works at Newark was organized to manufacture the machine. It was through his endeavors to perfect this machine that he discovered the expansive properties of naphtha. Prior to that time launches had been very little used owing to the large size of the boiler which it was necessary to carry, but when this property in naphtha was discovered Mr. Ofeldt devised the naphtha launch which immediately became popular. His latest discovery was the expansive properties of alcohol from which resulted the alco-vapor engine.

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Lewis Nixon of the Crescent ship yard is building a motor boat capable of crossing the Atlantic. According to reports the boat is to be 91 ft. long, 11 ft. 6 in. beam and 4 ft. draught, driven by two 400 H. P. Standard reversible engines driving twin screws. The motor boat will be of the most substantial construction, both sides and deck being of plates of the greatest possible tensile strength and durability. She will be able to obtain a speed of 22 knots in smooth water.

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The Baltimore Ship Building & Dry Dock Co. has just finished the tug Marion Cameron for the Tacoma Dredging Co. The hull was built by M. Mitchell, Davis & Son, Solomon's Island, Md., and was 90 ft. long, 9 ft. beam and 9 ft. deep. The machinery consists of one fore-and-aft compound engine with cylinders 14 and 28 in. diameter by 20 in. stroke of piston, supplied with steam from one Scotch return tubular boiler 11 by 12 ft., allowed 150 lbs. pressure.

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The well known Alaska steamer Nome City is to be converted into a steam schooner. The Nome City was, as her name implies, built for the Nome trade soon after the discovery of gold in the district.

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The noted motor boat Mercedes IV winner of the races from Calais to Dover has been sold by the owner M. Vedrine to Mr. Guinness, the famous brewer for $7,000.

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DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

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OCT. 20, 1904.

The Merchant Marine Commission, which has made a tour of the North Atlantic coast ports, the great lakes district and the Pacific coast, will immediately after the election resume its hearings in the South Atlantic coast cities. Quite a number of cities will be visited by a sub-commission and extended hearings will be held. Probably the final meeting of the commission will be held at Washington in order to give anyone, in any part of the country whatever who has not hitherto appeared, an opportunity to be heard. Meanwhile Mr. Winthrop L. Marvin, the secretary of the commission, will put into convenient form all data which has been obtained by the commission so that it may be readily digested by congress when it convenes in December. While no definite announcement has been made it is quite likely that some member of the commission will frame a bill embodying the recommendations of the commission. It is not expected that a minority report will be rendered by the commission. The commission has discovered the sentiment throughout the country to be practically unanimous in favor of the upbuilding of the American merchant marine and the testimony adduced proves conclusively that it cannot be upbuilt without governmental aid. It is interesting to note that the policy of differential duties appears to be the one most favored, though of course it is not the only form of remedy advanced. Under the policy of differential duties the American merchant marine in the early history of the country received its great impetus and it was really not until this form of protection was withdrawn that it began to decline. The commission has studied the question in all its phases and should be the most competent to judge as to the form of remedy. Whatever it may be it should be accepted by congress because without some form of aid the American ship cannot compete in over-sea trade and it would be a question of but a very few years before the United States would have no flag to protect upon the seas.

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The board of supervising inspectors of the steamboat inspection service have been called to meet in Washington on Tuesday next to consider various suggestions arising out of the report of the commission appointed to inquire into the causes which led to the General Slocum disaster. The report of this commission will be found in another part of the paper, and, as noted, as a result of it President Roosevelt has dismissed Supervising Inspector Rodie and Local Inspectors Dumont and Barrett. Undoubtedly the Slocum disaster was a terrible thing and every means should be adopted to prevent the recurrence of such a catastrophe. It is pertinent to call attention to the fact, however, that the board of supervising inspectors a year ago last June formulated a report recommending a great variety of changes in the rules and regulations governing the inspection of vessels. It is understood that one of the changes recommended would, if enforced, have rendered such a disaster as occurred to the Slocum highly improbable. Six weeks were spent by the board of supervising inspectors in formulating this report and in carefully outlining the changes to the existing code. This report was filed with the department of commerce and labor, but as far as is known it has never been made public nor has any action ever been taken upon it. It is not too forceful a thing to say that there has been dereliction of duty in official circles higher than steamboat inspection.

If any body of men is capable of making changes in the regulations governing the inspection of vessels it is the board of supervising inspectors since its members have been specially trained to that end. The commission appointed by the president to investigate the Slocum disaster has made a number of recommendations and it would not be surprising if they had duplicated some of the recommendations contained in the original report of the board of supervising inspectors. The majority of this commission has had no previous training along the lines of steamship inspection; nor has it had any training along commercial lines. This latter consideration is quite as important as the former. An enormous amount of capital is invested, and will be invested, in the steamship busi-

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ness in the United States and the regulations which govern the employment of this capital in the marine industry should not be framed by men who have never had to count the cost of things and whose business operations, whatever they may have been, have never been conducted with the necessity of making them profitable. As long as publicity has been given to the report of this commission, it would merely be a matter of ordinary justice to give publicity also to the original report of the board of supervising inspectors. The country has a right to know what that report contains.

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The manner in which industrial affairs are shaping themselves on the great lakes gives promise of great activity next year. Already the various ship yards have a comfortable amount of work on hand and within a week or two more will have under order all that they can possibly deliver by the opening of navigation next year. All the orders are for carriers of the largest size, showing that the day of the great carrier is here. And yet it is only fifty years since the average cargo of iron ore on the great lakes was only 150 tons. One of these new ships can carry in a single trip more than one of these old schooners could in three full seasons.

Ore is being rushed from upper lake ports and the total shipments for the year will make a respectable second to those of last year. At any rate there will be no such difference as was expected at the beginning of the season. There will be on Lake Erie docks at the close of navigation about the same amount of ore approximately as last year. It will be ample for a winter of normal consumption. Sales of ore, however, are picking up and increased activity is expected at the close of the presidential campaign. In fact signs portend a year of much business in 1905.

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## LAKE SUPERIOR ORE EXPLORATIONS

Duluth, Oct. 18.—It has been stated in many newspapers that the Cleveland Cliffs Iron Co. of Marquette was to remove its Gladstone charcoal iron furnace to Munising, Lake Superior, where it has many and varied interests. The company states that no such decision has been made, but it is possible that it may be determined to make the move later. The old St. Ignace charcoal furnace is now being re-erected at Boyne City where there is abundance of hardwoods for an indefinite period. This plant will be ready for operation next year and will have a capacity for 100 tons of iron daily. It is to be the largest and best equipped plant in the lower peninsula of Michigan. Fred Smith, formerly in charge of the Carp furnace at Marquette, is manager of the works.

The new furnace of the Lake Superior Co. at the Sault are to be blown in during November, and should make from 275 to 300 tons of iron daily. They will use a small amount of Michipicoten ore, getting the bulk of their mixture from Negaunee and Mesabi mines. The company's steel rail mill is now running steadily on imported pig iron and is making an average of 500 tons of 80-lb. rails daily. These are said to be good rails, and as the company's specifications for iron are quite severe there is no reason why they should not be. When these works ran a short time, two years ago, they used non-bessemer pig and made a rail that was not up to standard. This company is gradually getting its reorganization of working force complete and is wheeling its industries into line. It has no present idea of any attempt to erect coke ovens at the Sault but will utilize its own charcoal to as large an extent as practicable.

Mr. A. B. Willmott who had charge of the company's mining department explorations under the old regime has returned to his former place and active exploration may be expected later through the Canadian side of the Lake Superior region where indications are favorable. Mr. Willmott recently stated that in all the various Ontario iron formations, in all the years that exploration has been carried on there, the work done has been trifling in comparison with that in the 25 miles of the Vermillion range, between Tower and Ely, and this is undoubtedly true. It is also true, the politicians and others in Canada have assured the public, that there are large deposits of iron ore in both Ontario and Quebec, these deposits have not been found, and may not exist, though the probabilities are that, with systematic and detailed exploration on a large scale, ores may be found in any or all of the several ranges. Half a dozen districts in which the iron bearing rocks have been mapped, skirt the Canadian shores of Lake Superior, and the Hutton, Temagami and Eastern Ontario lie further to the eastward.

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## GRAIN SITUATION AT DULUTH

Duluth, Oct. 18.—The astonishing thing in northwestern grain world is the sale of Manitoba wheat for importation into the United States for consumption. On Friday and Saturday a Duluth exporting house sold to the Consolidated Elevator Co. of Duluth, 20,000 bu. 2 northern, Manitoba. This sale was somewhat in the nature of an experiment, but was at a profit. It was based on delivery here at 2¼ cents over Duluth 1 northern December, with the duty of 25 cents and the all-rail freight from Winnipeg to be paid by the seller. Exporting houses here have contended all this fall that the importing of wheat into the United States was sure to come this fall. It is possible that this importation was more for the purpose of bringing a lot of low American northwest wheat up to grade than for other purpose. The same house that made these trades was on Monday within 2 cents a bushel of selling round cargo lots, amounting to not much less than 1,000,000 bus., Manitoba wheat, for importation eastern milling centers for grinding. This wheat would go by lake from Fort William to Buffalo. It is very probable that such trades will be brought about in a few days. They would be still more astonishing and would be even more important in its bearing on the trade.

Barley at Duluth has evidently reached an export basis, for three loads were taken here for shipment to Montreal a day or two ago.

Wheat freights to Buffalo have been unchanged at 2¼ cents a bushel for some days and a good deal of room is being taken, chiefly on liners and smaller bulk freighters. About 1,000,000 bu. flax is to be shipped to Chicago.

Receipts of barley and oats for the past few weeks are heavy and these are holding up the elevator business to a high level. Wheat and flax receipts are less than a year ago, wheat on account of the higher prices paid at Minneapolis and flax on account of the anxiety of farmers to get their other grains marketed first. There are now in store at the head of the lakes about 13,300,000 bu. all grains, which is double the amount here at this time last fall.

The quality of grain arriving at Port Arthur and Fort William has been so poor this fall that a large amount is finding its way to the King hospital. There has been so much wet weather in the Canadian northwest that receipts are quite often off grade by dampness.

The steamship Huronic, of the Sarnia Line, will leave on her last trip Dec. 1 and will be the last of the passenger ships to depart from the head of the lake.

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## LAUNCH OF BATTLESHIP GEORGIA

The launch of the battleship Georgia at the yard of the Bath Iron Works, Bath, Me., last week was a success in every way. The governor of Georgia and his staff attended and the event was made quite a social affair. The Georgia was named by Miss Stella Tate, sister of Congressman Tate, who broke the customary bottle of champagne just as the great hull began to move. The picture of the launch on the opposite page will be found to be very striking.

The Georgia is one of the three battleships authorized under an act of congress, approved March 3, 1899, and is also a duplicate of the two battleships authorized under the act of congress, approved June 7, 1900. Bids for these five battleships were opened at the navy department, Nov. 15, 1900, and in February, 1901, the Bath Iron Works was awarded the contract for the Georgia. The four sister battleships of the Georgia are the Virginia, Rhode Island, New Jersey, and Nebraska.

The Georgia has a trial displacement of 15,000 tons. She is 435 ft. long, 76 ft. 10-in. beam, and will draw 24 ft. of water under trial conditions, with an extreme draught of 26 ft. when fully loaded and equipped with stores, coal ammunition, etc.

PERSPECTIVE VIEW OF BATH IRON WORKS AND BATTLESHIP GEORGIA.

The hull has a cellular double bottom and is divided into about 225 watertight compartments. Her armor consists of a main belt extending the entire length on each side of armor 11 in. to 4 in. thick. The upper casements armor and the athwartship armor is 6 in. thick. The 12-in. turrets and barbettes are covered with 10-in. armor, the 8-in. turrets and barbettes with 6-in. armor. The conning tower is 9 in. thick, the signal tower 5 in. thick, and the gun protection and splinter bulkheads are from 2 in. to 3 in. thick. The total weight of the armor is about 3,700 gross tons. In addition to the above the Georgia has a protective deck throughout her entire length and breadth at about the level of the waterline. All the vitals of the ship, that is the motive and steering power, together with the electric light plant, are below this deck and consequently below the water line. In addition to this protection, the Georgia has a complete belt of cofferdams at the waterline which are filled with cellulose which has the characteristic of promptly swelling to several times its original bulk when wet, thereby stopping any hole made by shot.

Her main battery consists of four 12-in. breech-loading rifles, eight 8-in. breech-loading rifles, twelve 6-in. breech-loading rapid fire rifles, twelve 3-in. breech-loading rapid fire rifles, twelve 3-pounder guns, four 1-pounder automatic guns, four 1-pounder single shot guns, two 3-in. field guns, two machine guns and six automatic guns. The Georgia is also provided with four submerged torpedo tubes.

The 12-in. guns are mounted in pairs in two turrets, one forward and one aft. Four of the 8-in. guns are mounted in pairs of two turrets, superposed on the 12-in. turrets. The other four 8-in. guns are mounted in two broadside turrets, one on each side. The 6-in. and 3-in. guns are mounted in broadside.

Quarters are provided for the following complement of men, which the vessel will have when in commission: One flag officer, one commanding officer, one chief of staff, twenty wardroom officers, twelve junior officers, ten warrant officers and 658 crew, including marines, total 703.

The Georgia will carry the following boats which are lifted and stowed by four large electric swinging cranes, two on each side of the ship: One 50-ft. steam cutter, one 36-ft. steam cutter, two 36-ft. launches, four 30-ft. cutters, two 30-ft. whaleboats, one 30-ft. gig whaleboat, one 30-ft. barge, two 20 and one 16-ft. dinghies, two 12-ft. punts, two 18-ft. life rafts.

The bunker capacity of the Georgia provides for a stowage of 1,900 tons of coal.

The Georgia's propelling machinery consists of two four-cylinder, triple-expansion engines, each driving one bronze three-bladed propeller, about 18 ft. in diameter. Each engine consists of one high-pressure cylinder 35 in. in diameter, one intermediate cylinder 57 in. in diameter and two low-pressure cylinders 66 in. in diameter, all having a stroke of 48 in. The engines exhaust into two condensers each having a cooling surface of about 12,000 sq. ft. Each main engine is in a separate compartment together with its condenser, air pump, circulating pump and other auxiliary machinery. The boilers are twenty-four in number, installed in eight watertight compartments. They are of the Niclausse type and have a total grate surface of about 1,440 sq. ft. and a total heating surface of about 57,220 sq. ft. The boilers are to be worked under a forced draft of 1 in| The above propelling machinery will give the Georgia a speed of 19 knots per hour, which is one knot faster than any battleship now in service in our navy.

The Georgia has a very elaborate electric plant consisting of two 100-kilowatt generators, and six 50-kilowatt generators which are each direct connected to its double engine. This generator installation will provide current for six 30-in. search lights, about 1,000 incandescent lamps, several arc lamps, night signaling sets, diving lamps, electric blowers for ventilation and will also provide current for electrically turning the turrets, training the guns, ventilating the ship, lifting and stowing boats, lifting coal, stores and handling ammunition from the magazines to the guns, providing power to run the machine shop, the laundry and for several other purposes.

The Georgia is provided with an elaborate evaporating and

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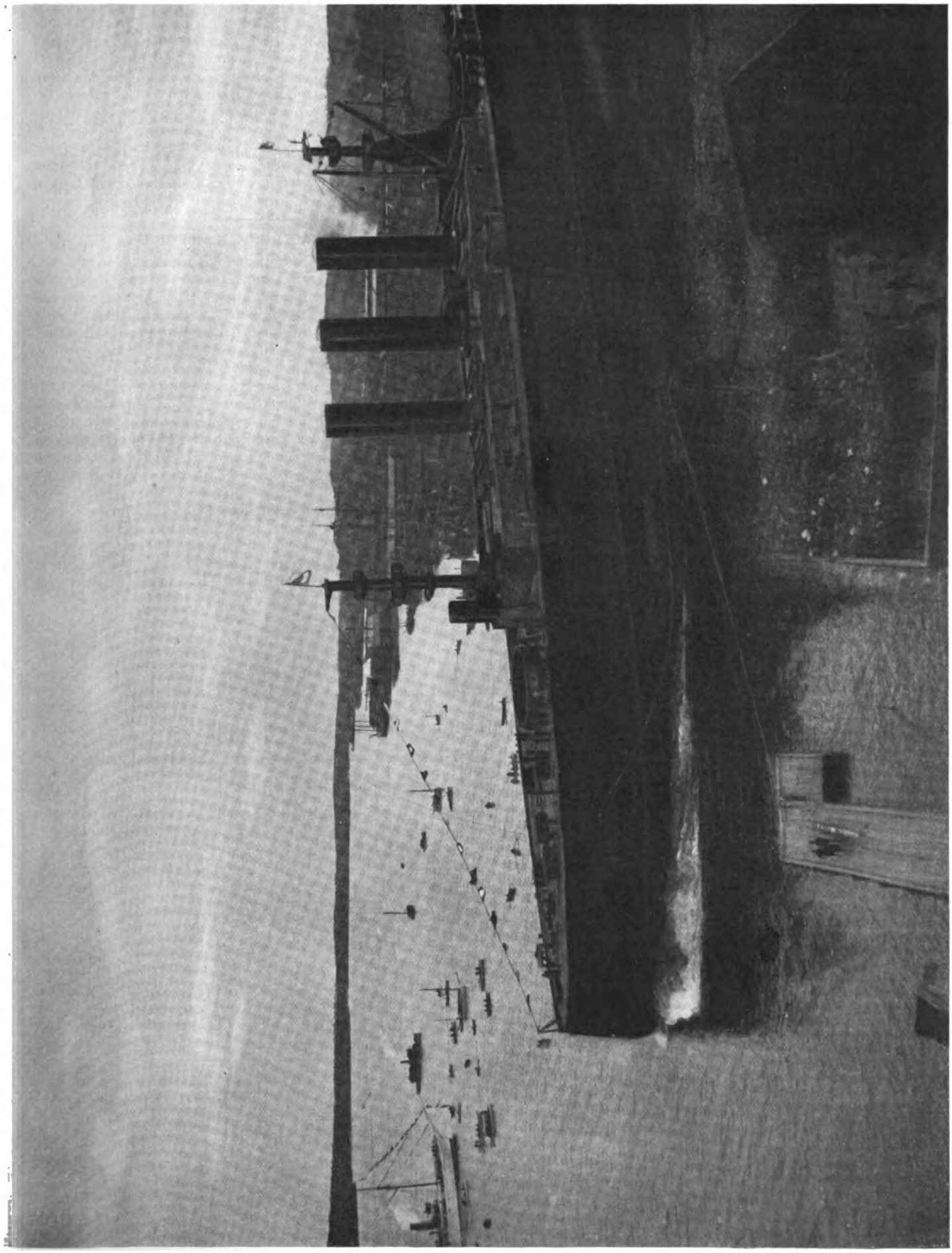

A STRIKING PHOTOGRAPH OF THE GEORGIA TAKEN AS SHE STRUCK THE WATER.

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distilling plant for making fresh water from salt, an ice plant for making ice and for cooling store rooms, a compact and well equipped laundry, thoroughly equipped galleys for cooking and baking, a machine shop capable of doing all but the largest work, complete electric signaling communication throughout the ship, telephones, wireless telegraph apparatus, air compressing plant, complete gear for coaling ship and removing ashes, steam steering gear, steam anchor engine, and electric winches for doing all sorts of lifting and hauling throughout the ship.

The Georgia will have two military masts equipped with fighting tops and signaling gear. She will have three smoke funnels, which, by the way, are now in position, she being the first battleship to have her smokestacks in position and steam up at the time of launching.

On Oct. 1 by the bureau's records, the Georgia was 65.3 per cent completed on the hull, and about 89 per cent completed on the machinery. All the main and auxiliary machinery is in place on board with its piping, with the exception of the main engines. The main engines are completely erected in the machine shop ready to go on board immediately after launching. The contract price of the Georgia is $3,590,000. As the Georgia lies upon the stocks ready for launching she weighs 7,000 gross tons.

We add a table which shows the growth of our battleships in length, size, power and speed:

| Battleship. | Length. | Tonnage. | H P. | Speed. |
|---|---|---|---|---|
| Oregon | 348 ft. | 10,288 | 10,500 | 16 knots. |
| Kentucky | 368 ft. | 10,540 | 12,000 | 16.5 " |
| Maine (new) | 388 ft. | 12,300 | 16,000 | 18 " |
| Georgia | 435 ft. | 15,000 | 19,000 | 19 " |

## FREIGHT SITUATION

It is absolutely true that those who are most informed concerning current conditions in the iron trade are the least able to accurately forecast the future. When the season of navigation opened on the great lakes, practically six weeks later than usual, expert authorities predicted that the movement of ore would not exceed 14,000,000 tons and one or two were inclined to put it as low as 12,000,000. Since then there has been a great revision of figures, a million or more at a time, until now the latest estimate is that the total shipments of the season will be between 18,000,000 and 19,000,000 tons. All things considered this is not a grave falling off from the shipments of last year when aproximately 23,500,000 tons were shipped. Proportionately the shipments this year have been heavier than they were last. The heavy movement of September, some 4,006,000 tons, will be equalled if not surpassed during the present month. Ore is moving now heavier than it ever has during fall months and there is excellent demand for ore boats. However, shippers are having no trouble in obtaining tonnage but the demand is nevertheless active. The fleet of the Steel Corporation became congested at Conneaut this week, a fair portion of its carriers being at the lower end of the lakes, but the delay resulting therefrom was not serious. Probably the average was not over three days. Notwithstanding the heavy flow of ore and the brisk demand for boats the freight rate continues normal. The only advance has been in the Marquette rate which has been marked up 5 cents this week, making it 65 cents. Under ordinary conditions the freight rate would be much better, but the grain and coal trades are lending but little support and shippers are therefore able to get all the vessels they want at the old rates.

The vessels of the Steel Corporation have capacity to about 1,500,000 tons a month and it is an interesting commentary upon the estimate of their calculations that they will bring down within 250,000 tons of what the company estimated it would move at the beginning of the season. The corporation is now figuring upon the building of four more carriers which would increase its carrying capacity approximately 800,000 tons per annum. With good dispatch its fleet would then be able to carry something over 11,000,000 tons in an average season. This sum, however, would not meet the corporation's requirements for ore in an active year. It brought down 16,500,000 tons in 1902 and 12,500,000 in 1903. The corporation has a number of furnaces which have never even been lighted since they were acquired, so that it can readily be seen that its ore burning capacity is greater than its ore carrying capacity. However, the addition of four modern freighters would strengthen its position materially in the freight market, if indeed it can be said to require any strengthening.

## CHICAGO GRAIN REPORT

Chicago, Oct. 18.—Receipts of grain are comparatively suitable as to quantity but a temporary scarcity existed in round lots of the requisite shipping grades of wheat and corn, and thus during the past week vessel offerings obtained slightly in excess of shippers' inquiry. However the more attractive business at Lake Superior is gradually reversing this position.

Rates are substantially unchanged and steady at 1⅜ cents wheat, 1¼ cents corn, and 1⅛ cents oats for Lake Erie, Georgian Bay, etc., and at 3¾ cents corn through to Montreal.

Line steamers are quite busily engaged with package freight handling and may be considered practically out of grain trading. Reports concerning general handling about the docks are favorable; the freight distributing interiorward with good regularity.

Weekly shipments are distributed about as follows: Via all rail lines—wheat 302,000 bu., corn 270,000, oats 900,000 and barley 155,000; via lake to Buffalo, etc.,—wheat 312,000 bu., corn 1,200,000, oats 580,000 and barley 60,000; and to Canada points via lake—corn 120,000 bu., oats 250,000 and barley 61,000.

Lake and rail shipments:

| | This week. | Last week. | Same week last year. |
|---|---|---|---|
| Wheat | 614,680 | 312,942 | 856,720 |
| Corn | 1,649,009 | 1,719,238 | 3,201,887 |
| Oats | 1,730,412 | 834,085 | 1,467,600 |
| Barley | 271,000 | 144,000 | 75,000 |
| Total | 4,274,101 | 3,010,265 | 5,601,207 |

Shipments since Jan. 1st, 1904:

| | Shipments since Jan. 1, 1904. | Same time last year. |
|---|---|---|
| Wheat | 12,434,549 | 17,375,033 |
| Corn | 61,115,086 | 75,081,901 |
| Oats | 37,127,640 | 52,562,013 |
| Barley | 35,800,000 | 18,200,000 |
| Total | 146,477,275 | 163,219,037 |

Stocks of grain in elevators:

| | This week. | Last week. | Same week last year. |
|---|---|---|---|
| Corn | 3,312,000 | 4,350,000 | 4,707,000 |
| Wheat | 4,760,000 | 4,413,000 | 5,580,000 |
| Oats | 11,005,000 | 10,811,000 | 2,480,000 |
| Rye | 704,000 | 719,000 | 600,000 |
| Total | 19,781,000 | 20,293,000 | 13,385,000 |

Repairs to be made to the steamer City of Berlin this winter will cost $40,000, this estimate having been made by the survey completed by the owners and underwriters. The Manitowoc Dry Dock Co., Manitowoc, Wis., will do the work.

The steamer City of Glasgow stranded near the village of La Pointe, Sand Island, last week. As she rested in a sandy bottom she was in no danger whatever and her cargo of iron ore was jettisoned to release her.

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## SHIP BUILDING ON THE GREAT LAKES

Two months ago no one could have predicted the great revival that is marking the ship building industry on the great lakes. Sufficient work is now assured to keep all of the ship yards busy throughout the winter. The American Ship Building Co. has contracts for ten vessels and is actively negotiating for the construction of others. The particulars of these ten vessels will be found in the accompanying table. President J. C. Wallace and General Manager Robert Logan of the American Ship Building Co. visited West Bay City this week to outline the work of putting the yard in shape for the construction of the two large Tomlinson steamers. Mr. Hugh L. Timm of Lorain has been appointed superintendent of the West Bay City yard.

The Great Lakes Engineering Works has contracts for four vessels which have been definitely announced. Two of these steamers are for Mr. G. A. Tomlinson of Duluth, one is for the Western Transit Co. of Buffalo and the other is for the Cleveland Cliffs Iron Co. of Cleveland. The table regarding the work of the Great Lakes Engineering Works could not be compiled this week owing to the fact that the leading features of the Cleveland Cliffs steamer had not been determined upon. Negotiations are also under way for the construction of other steamers by this company of which more will be known in a few days.

The United States Steel Corporation has been figuring for the past few days upon the construction of two or four freighters of the largest carrying capacity. Mr. Harry Coulby, the president and general manager of the Pittsburg Steamship Co., has had the matter under advisement with the officials of the Steel Corporation at New York and a definite announcement concerning the corporation's policy in this particular is expected within a day or two.

No definite information has been received as to whether the Craig's are really to build a turbine steamer for the Dunkley-Williams Co. of Chicago, but it does not appear that it is to be built during the coming winter. Great interest was aroused by the announcement that this steamer was to be built because, with the exception of the little experimental steamer Revolution equipped with Curtis turbines, no turbine steamer has as yet been constructed in the United States. This matter is doubtless one of the future and must be dismissed in any discussion of work under way. The Craig's have received a contract from the United States government for the construction of the lighthouse tender Aspen at an approximate cost of $69,750.

Mr. James N. Smith of the Collinwood Ship Building Co., Collinwood, Ont., writes very interestingly concerning the state of ship building in the Dominion, stating that both Canadian ship builders and shippers have much to contend against. His letter is as follows:

"Am very sorry to say that up to the present we have not received any orders for any steamers for the coming season, and we have not received even one enquiry regarding same. The Canadian shipping trade on the lakes is in the unfortunate position that the American over-seas traffic is. The Canadian shipping trade is open to competition from the British ships, and the British ships have full and free use of our waterways and ports, so that the cheaper built British ship is brought into straight competition with the Canadian built ship. This discouraging fact prevents Canadian marine people from investing their money into what they consider an uncertain proposition. I am greatly pleased to see the ship building work picking up in the American lake yards. This may be a direct encouragement to Canadian ship owners to further invest in lake carriers."

The Palmer Boat Co., Highland Park, Ill., completed during the summer the auto boat Togo which has been in service on Geneva Lake, Wis. The Togo is 27 ft. over all, 4 ft. 3 in. beam and her power is furnished by a high speed automobile gasoline motor developing 14 B. H. P. at 1,100 revolutions. The Togo has proved herself to be the fastest launch on Geneva Lake.

VESSELS UNDER CONSTRUCTION ON THE GREAT LAKES.

**American Ship Building Co.'s Yards.**

| Yard Number | To be built at | Type | Dimensions in Feet: Over all | Keel | Beam | Depth | Dimensions of Engines | Boilers, dimensions in feet and inches | Draft | Steam pressure Pounds | Capacity Gross tons | For whom building |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 333 | Lorain | Bulk Freighter | 500 | 480 | 52 | 30 | 22½, 36, 60-42 | Two Scotch 13.9 x 11.6 | Ellis & Eaves | 180 | 8,000 | G. A. Tomlinson, Duluth |
| 334 | Lorain | Bulk Freighter | 552 | 532 | 56 | 31 | 18½, 28½, 43½, 66-42 | Two Babcock & Wilcox | Assisted | 250 | 10,000 | Acme Steamship Co., Duluth |
| 335 | Lorain | Bulk Freighter | 500 | 480 | 52 | 30 | 22½, 36, 60-42 | Two Scotch 13.9 x 11.6 | Ellis & Eaves | 180 | 8,000 | B. & S. Steamship Co., Buff'o |
| 336 | Lorain | Bulk Freighter | 500 | 480 | 52 | 30 | 22½, 36, 60-42 | Two Scotch 13.9 x 11.6 | Ellis & Eaves | 180 | 8,000 | H. Steinbrenner, Cleveland |
| 158 | Wyandotte | Bulk Freighter | 545 | 525 | 55 | 31 | 23½, 38, 63-42 | Two Scotch 14 6 x 11.6 | Ellis & Eaves | 180 | 10,000 | Samuel Mather, Cleveland |
| 159 | Wyandotte | Bulk Freighter | 545 | 525 | 55 | 31 | 23½, 38, 63-42 | Two Scotch 14.6 x 11.6 | Ellis & Eaves | 180 | 10,000 | U. S. Trans. Co., Syracuse |
| 423 | Cleveland | Pas.& Pkt. Frt. | 361 | 340 | 45 | 28 | 22, 31½, 45, 65-42 | Four Scotch 12.6 x 11.6 | Howden | 210 | 3,500 | Anchor Line, Buffalo |
| 424 | Cleveland | Bulk Freighter | 400 | 380 | 50 | 28 | 19, 30, 52-40 | Two Scotch 12 x 12 | Natural | 170 | 6,000 | W. H. Becker, Cleveland |
| 613 | West Bay City | Bulk Freighter | 524 | 504 | 54 | 30 | 22½, 36, 60-42 | Two Scotch 13 9 x 11.6 | Ellis & Eaves | 180 | 9,000 | G. A. Tomlinson, Duluth |
| 614 | West Bay City | Bulk Freighter | 524 | 504 | 54 | 30 | 22½, 36, 60-42 | Two Scotch 13.9 x 11 6 | Ellis & Eaves | 180 | 9,000 | G. A Tomlinson, Duluth |

**Bertram Engine Works Co., Toronto, Ont.**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Toronto | Tug | 95 | 86 | 19 | 10 | 14, 28-20 | One 10 x 12 | Natural | 160 | ..... | Keewater Lumbering & Mfg. Co., Keewater, Ont. |
| | Toronto | Dredge | 90 | 90 | 36 | 9 | ..... | ..... | ..... | ..... | ..... | Dominion Government |
| | *Toronto | Dbl.end'd ferry | 140 | 114 | 34 | 12 | 19, 20, 20-18 | Two 7.6 x 17 | Natural | 140 | ..... | City of St. John, N. B. |
| | | | | | 49 | | | | | | | |

*Hull only building by the Bertram Engine Works Co.

In a collision last week with the steamer Ira H. Owen the big steel steamer Henry W. Oliver of the Wilson Transit Line was so badly damaged that she had to be beached to prevent her from sinking in the middle of deep water in St. Mary's river. The accident was caused by a confusion of signals between the two passing vessels. The Oliver was bound down with a cargo of iron ore. The Oliver was struck on the port side below the water line just abreast of the forward hatch. The bow of the Owen was badly bent but not sufficient to incapacitate her. The Oliver has twelve broken plates and will be repaired at Chicago.

The steamer Eastland belonging to the Michigan Steamship Co., South Haven, Mich., will undergo some radical changes during the winter. The changes involve a complete reconstruction of the upper part of the boat. The upper decks are to be cleared entirely of staterooms located there and many changes will be made in the main deck. The stockholders of the Michigan Steamship Co. have just agreed to an assessment of $25 per share in order to provide sufficient working capital for next season's business.

The Anchor Line has decided to sell the wooden steamer Juniata.

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## REPORT ON GENERAL SLOCUM CASE

In all this investigation into the General Slocum disaster one very important feature has been overlooked, and is still overlooked in the summary dismissal by President Roosevelt of Supervising Inspector Robert S. Rodie and Local Inspectors James A. Dumont and Thomas A. Barrett of New York. That is the fact that the board of supervising inspectors spent six weary weeks a year ago last summer in Washington in revising the entire code governing the inspection of steam vessels and, as a result of their labors, formulated a report recommending a great variety of changes. This report was submitted to Mr. George B. Cortelyou, secretary of the department of commerce and labor but no action, so far as is known, was ever taken upon it. Nor, indeed, has it ever been made public. All that is known about it is that the board spent two days explaining the provisions of the report to Lawrence O. Murray, the assistant secretary of the department of commerce and labor. The dismissal of these three officials does not mend matters any. There has been laxity of duty in circles higher than the board of supervising inspectors. Had the recommendations of the board been put into effect promptly, instead of being literally shelved, the disaster to the General Slocum might never have occurred.

There is no purpose to quarrel with the report which the commission, appointed to investigate the Slocum disaster, has just submitted to the president. It is pertinent to say, however, that there are some things about a seafaring life which no landsman will ever be able to understand—and a majority of this commission are landsmen. The only really competent man upon it—competent for the purpose—is George Uhler, supervising inspector general of the steamboat service. Lawrence O. Murray and Herbert Knox Smith are lawyers and Gen. J. M. Wilson and Com'dr Wilson are connected with the army and navy respectively. Careers in the army and navy, however honorable they may be, do not fit men to pass upon commercial subjects. Commerce is dollars and cents and army and navy officials rarely have to count the cost. They may be said to be by training unfitted to make recommendations for the government of any commercial pursuit. The board of supervising inspectors could have done far better with this report—and probably have already done so if it were possible to get at their original report.

President Roosevelt, in addition to discussing the Slocum report, goes also into the matter of the Nonpareil Cork Works of Camden, N. J., which put iron bars into life-preserver blocks, and contains a strong recommendation to Secretary Metcalf of the department of commerce and labor, to whom his report is addressed, as to the future conduct of the steamboat inspection service. The president's letter is as follows:

White House,
Washington, Oct. 12, 1904.

My Dear Sir:

"I have received the report of the 'Commission of the United States on the Investigation of the General Slocum disaster,' and the report of the department of justice of Oct. 12, recapitulating what has been done by the department of justice in connection with the criminal proceedings taken against various individuals because of their connection with the disaster. I send you herewith both reports.

"Punitive action by the government can of course only take two forms: (1) That of legal proceedings against those either within or without the service and (2) removal from office of those within the service. It appears that the department of justice has already secured indictments against the master and captain of the Slocum and against the managing directors of the Knickerbocker Steamboat Co., to which company the Slocum belonged, for misconduct, negligence, and inattention to duty by the captain, and for aiding and abetting therein by the managing directors.

"Furthermore the department of justice has secured indictments against Henry Lundberg and John W. Fleming, the assistant inspectors of the steamboat inspection service, who actually inspected the Slocum, for fraud, misconduct, and inattention to duty. Lundberg had been appointed merely on probation in the service, and has been dropped. There can, of course, be no further action taken about Fleming until his trial has been finished, although it does not follow that an acquittal would prevent the department from discharging him from the service.

"In addition, the department of justice has secured the indictment of the manager and three employes of the Nonpareil Cork Works of Camden, N. J., for putting upon the market compressed cork blocks for use in making life-preservers, each of which blocks contained in its center a piece of bar-iron weighing several ounces.

"This last offense was of so heinous a character that it is difficult to comment upon it with proper self-restraint. It appears that the national legislature has never enacted a law providing in set terms for the punishment of this particular species of infamy, doubtless because it never entered the head of any man that so gross an infamy could be perpetrated. I suggest that you report this whole matter to congress, transmitting these two reports, and at that time calling special attention to the need of imposing an adequate penalty for the making or selling of defective life saving appliances.

"So much for what the department of justice has done in reference to the disaster. But in addition to the men put on trial by the department of justice, action should be taken against those employes whose responsibility for the state of things producing the accident has been brought out in the report of the commission. According to this report, it appears that in addition to the two assistant inspectors who are now on trial, the supervising inspector of the second district, Mr. Rodie, and the two local inspectors of the port of New York, Messrs. Dumont and Barrett, should all three be removed for laxity and neglect in performing their duties. As regards the conduct of Mr. Rodie, Mr. Uhler dissents from the conclusions of the four other commissioners.

"I agree with the conclusions of the other four. Laxity and neglect, where the consequences may be so terrible as they have proved to be in this case, can not be passed over even where there has been good conduct in other respects on the part of the man implicated. Accordingly the three officials named will be removed from the service.

"Moreover, you will please direct their successors in office at once to conduct a thorough examination of the entire inspection force of the port of New York, with the object of weeding out all the men whom such examination shall show to be unfitted to perform the very arduous and responsible duties of their positions. The supervising inspector general has at present no headquarter's force of special agents, so that it is undoubtedly very difficult for him to exercise any adequate and direct supervision over the various local divisions of the inspection service. In each division he must rely chiefly on the fidelity and energy of the local heads; and if these fail to perform their duty they must be held accountable. He must however, exercise as thorough a supervision as the means at his disposal allow.

"In order that I may be informed as to the exact condition of the service in all its parts, I direct you to order a searching investigation, in continuance of the investigation of the commission, into the conduct of the central office and of every outside subdivision of the service save that in New York.

"You will also make such changes in the regulations as are recommended by the commission, and you will therefore call a special meeting of the board of supervising inspectors for this purpose. You will also lay before the congress a request that the law be changed in the various particulars recommended by the commission. I wish particular emphasis laid

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upon the proposal of the commission that there be created by law a special body thoroughly to investigate the laws which are supposed to provide for the safety of passengers on steamboats, especially on excursion boats, where the prime causes of danger are the overcrowding and the flimsy and highly inflammable character of the superstructures.

Very truly yours,
THEODORE ROOSEVELT."

The report of the commission itself is exhaustive and covers sixty-two printed pages, containing about 32,000 words. It begins with a description of the vessel, in the course of which it is stated that:

"All the upper works of this vessel were constructed of light wood, and had been painted and varnished many times, and were, therefore, in a highly inflammable condition. In the construction of the vessel there were no safeguards against fire other than compliance with the regulations as regards the proximity of woodwork to boilers. The vessel had no fireproof hatches or bulkheads, and was built entirely of wood."

After stating that when a fire once got headway on such a vessel it could not possibly be checked, the report says:

"There are many similar vessels doing service in the waters of the United States, the construction of which is quite as dangerous as that of the Slocum, and unless this kind of construction shall be prohibited or modified by law the safety of a large number of passengers carried by excursion steamers and steamers plying on the inland waters of the United States can not be assured."

The report adds points in connection with the fire on the steamboat now generally known throughout the exhaustive coroner's inquest, but the new fact was brought out at the commission's hearings that the colored porter of the boat, William Payne, went into the forward cabin, where the fire started, on the day of the disaster, and having lighted one of the lamps stored there with a match, "threw the match on a bench." He also found when he entered the cabin, filled as it was with highly inflammable material, that an oiler was working there using an open torch as a light.

"The condition of this cabin, with the purpose for which is was used," says the report, "constitutes one of the essential facts of the negligence contributing to the disaster."

The report then exhaustively reviews the fire-fighting appliances on the Slocum; how the hose burst and the crew attempted to couple on another hose without removing the coupling still remaining on the standpipe; how the crew pulled down a few life preservers, and how the master of the vessel gave the order to run full speed to North Brother Island without going to the scene of the fire or getting the opinions of his assistants as to where to beach the vessel.

Capt. Van Schaick is blamed in these words:

"The evidence before the commission establishes the fact that the master made no attempt whatsoever to fight the fire, to examine its condition, or to control, assure, direct, or aid the passengers in any way whatever. It is alleged that he was unable to reach the place where the passengers were by reason of the fire, but this is contradicted by the evidence of many witnesses, and is obviously not true."

From a review of the whole testimony as to the time of the discovery of the fire the commission comes to the conclusion that it was first discovered before reaching Ward's Island; that the mate, Edward Flanagan, knew of it at that time and informed the pilot house. The statements of the captain and pilots radically disagree with statements by other witnesses, but the commission states that it is forced by the weight of the entire evidence to the belief that "the statements of the men in the pilot house must be disregarded, and that they are incorrect in so far as they refer to the time the fire was first discovered." The report also says:

"After careful consideration of the entire testimony as to the time of the discovery of the fire, the commission is of the opinion that the men in the pilot house had knowledge of the fire before the steamer passed the eastern end of Ward's Island. The commission therefore believes that the master knew of the fire in time to have beached the vessel either in Little Hell Gate to the westward of the Sunken Meadows, or in the Bronx Kills to the eastward of the Sunken Meadows, and to have thereby gained the great and essential advantage of placing the vessel with her stern to the wind so that the flames would be driven forward and away from the passengers, instead of taking a course that inevitably drove the flames rapidly aft, toward the passengers, and delayed the beaching of the vessel for several minutes longer than was necessary."

The commission finds that the vessel was beached with her bow in 7 ft. of water, so that the few persons there jumped into the water not much over their heads, but the stern of the boat, where all the passengers were congregated, was in from ten to thirty feet of water, so that from 400 to 600 persons were drowned at that point after the vessel had been beached. The report then says:

"The commission is therefore of the opinion that Pilot Van Wart showed bad judgment or lack of skill in beaching the vessel at a considerable angle with the shore line of North Brother Island, thus leaving in deep water all but the bow of the boat, which was in flames, and affording the passengers who could not swim little opportunity to save their lives. Even had it been necessary to beach on North Brother Island, the vessel should have been laid on the shoal to the northward and eastward of the island, approximately tangent and parallel to the shore line, with her keel hard on the bottom, the burning side of the vessel to leeward and her guard on the starboard side overhanging shoal water, so that the passengers could have dropped overboard on that side and waded ashore."

The commission finds "that most if not all the life preservers were of granulated cork, and at least a large percentage of them were bad, due mainly to rotten covers, which tore under the handling to which they were subjected." It finds that the mate, "in distinct violation of the law and contrary to the requirements of the vessel's certificate, was not a licensed officer;" and there were no fire drills, and adds:

"The inefficiency and poor quality of the deck crew of this vessel, doubtless typical of the majority of the crews of excursion steamers, is one of the essential facts that caused the loss of so many lives."

The commission pays a tribute to the masters of the tugs John L. Wade and Walter Tracy, without the assistance of whom it says, the loss of life would have been from 200 to 350 greater.

All of the passengers who were saved, with but few exceptions, the report states, were saved by outside assistance. "This indicates," the commission says, "the almost complete helplessness of an excursion party of this particular composition, even when most of the passengers were brought to a place within at least 200 feet of the shore. A very important conclusion from this set of facts is that the law and regulations must recognize the fact that an excursion party must be taken care of, and cannot take care of itself."

Summing up the situation, the commission says:

"The salient points of this disaster to be noted for future use are as follows:

"1. The Slocum was probably typical in almost all her conditions of many of the excursion boats in New York harbor and, doubtless, elsewhere.

"2. The peculiar helplessness characteristic of an excursion crowd in case of disaster.

"3. Peculiar inflammability of vessel and extraordinarily swift progress of fire.

"4. Collapse of deck, apparently due to weight of crowd.

"5. Marked inefficiency of crew, both in this case and prob-

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ably in most other excursion vessels, principally due to lack of organization and drill.

"6. Total lack of fire drills, boat drills, and established discipline.

"7. Unlicensed mate.

"8. Extremely dangerous condition of the forward cabin.

"9. Total failure of fire hose.

"10. Badly defective condition of life preservers.

"11. Inefficient inspection of this vessel.

"12. Neglect of master to fight fire or aid passengers, or to give any orders to such end.

"13. Neglect of master to beach the vessel or to put her alongside of a wharf immediately after receiving a report of the existence of the fire, and his action in maintaining a high speed and creating thereby a strong draft of air from forward sweeping the flames aft."

The commission gives its opinion as to the responsibilities of owners, masters, and employes of excursion vessels, and adds this conclusion:

While it is true that it is the business of the steamboat inspection service to see that proper safety appliances as required by law are provided, this by no means relieves the owner from a similar legal and moral obligation, nor from the liability for the maintenance of proper crew discipline. The commission is of the opinion that the owners of the General Slocum are censurable in a high degree for the inadequate and improper conditions prevailing on board this vessel, and that, whatever may be their technical legal liability, they and their executive agents share largely in the moral responsibility for the awful results of this disaster.

In connection with its inquiry, the commission made a thorough investigation of the conditions and actual workings of the steamboat inspection service of the port of New York, both for the explanation of certain features of the disaster and for the prevention of similar disasters. It did not extend its inquiry beyond the port of New York, as it says that a general investigation would have been impracticable at present and would have delayed the report until its usefulness would have been greatly diminished. The commission believes that, as New York is the most important port in the country, a careful inquiry into the workings of the service there would serve as a sufficient basis for general remedial recommendations.

The commission finds that the work of the local inspectors was "inefficient and unsatisfactory" and that they were interpreting their duties in a manner not warranted by the statutes. For instance, it was their uniform habit to say that fire hose was "in good condition." According to the testimony of the inspectors themselves, the hose was subjected to a visual inspection.

"The absurd and inadequate nature of such mere visual inspection of fire hose," the report says, "is apparent from the innumerable cases in which hose equipment, passed at the regular inspection, burst on the reinspection under pressures all below the statutory requirement, and varying from 5 to 95 lbs. In some vessels 60 per cent of the hose equipment was condemned."

The inspection of life preservers on all vessels was confined to looking them over and taking down those which "looked bad." The inspectors never lowered the boats or examined the tackle. Assistant inspectors were not drilled as to their duties, but were turned loose to do the best they could. The report recommends that there be a complete reorganization of the force of assistant inspectors with a view of eliminating those who have shown their incompetency.

"The supervising inspector," the commission says, "knew of the existence of the faulty and inefficient system and of the negligence of the local inspectors to enforce and the actual failure of the assistants to make proper inspections. If he did not know of these, or, knowing them, did not take steps to remedy them, he is equally chargeable with neglect of duty."

The commission goes at great length into the deficiencies found on vessels reinspected. Boilers and hulls were found to be substantially good, but fire pumps, hose, and life preservers were universally in bad condition, in spite of the fact that all had been previously passed upon as good. The gross inefficiency of the system was shown when on reinspection the percentage of deficiency in life-saving apparatus was found to be 33 per cent on excursion and 14.33 per cent on ferryboats, while in fire hose the deficiency was 15.57 on ocean, 18.78 on inland, 26.35 on excursion, 15.53 on ferry, and 17.80 on tow boats.

No evidence was adduced, the commission says, to show that there was any "graft" in the system, but it holds that the men who are responsible for human lives must discharge their duties in full and in order that the proper results may be accomplished there should be a fundamental change in the personnel and methods of the inspectors. It holds Rodie, Barrett, and Dumont entirely responsible and says that a reasonable view of the matter makes it clear that subordinates cannot be expected to be more efficient than their superiors.

The commission makes many recommendations as to what should be done in the building and equipment of vessels. It says that there is no reason why the disaster to the General Slocum might not be duplicated on any one of the hundreds of vessels still running in New York harbor and elsewhere. "The Slocum was not abnormal," it says, "it was typical."

Authority is asked to give the department of commerce and labor absolute authority to enforce upon owners of vessels provisions as to safety appliances and construction, and to say just what appliances vessels must carry, the present laws being regarded as inadequate in this regard. It recommends that the law be so amended as to make it possible readily to bring home a criminal liability upon individual owners where their vessels have been navigated without proper equipment. Inspectors should also have power to see that defective equipment is destroyed as well as condemned, and to see that fire drills and boat drills are regularly held. The government should also have the power to seize a vessel which does not comply with the provisions of the law.

The commission also comments strongly on a point brought out at the coroner's inquest concerning the pay to inspectors. It appears now that they are paid according to the number of vessels they inspect. The commission says:

"The objection to this system is apparent from the mere statement of it. The inspection of one vessel, more or less, might make a difference of from $250 to $300 in the annual salary of an inspector. The result has naturally been that inspectors have in many cases given their chief attention to the mere matter of getting vessels to submit to inspection, regardless of whether such inspection was properly made or whether their other duties were properly performed; and thorough, careful, and honest inspection correspondingly penalized."

A recommendation aimed directly at Inspector Dumont is contained in the report to the effect there should be an age limit for inspectors, as the work of the service demands an unusual amount of physical exertion if the inspection is to be properly performed. Gen. Dumont is nearly eighty years old.

The report says that there should be a very clear and complete definition in the law regarding ferryboats, which now are permitted, under excursion permits, to go beyond their authorized routes with passengers only.

"The matter is important," the report says, "because ferryboats now enjoy certain exemptions from the usual requirements as to equipment, and, in the case of a true ferryboat operating over its comparatively short route and constructed after the peculiar manner of the usual ferryboat, with a very broad beam, with exceptionally good means of access and egress, and

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carrying most of her passengers on one deck, there is not so great need of the maximum equipment that is required on the usual excursion boat."

These recommendations will be transmitted to congress at its approaching session, and legislation will be asked along the lines of the report and the recommendations of the commission.

## PANAMA CANAL AND THE AMERICAN SHIP

Editor Marine Review: I agree with Mr. James H. Dewson in your issue of the 6th, that the Panama canal might be made a most effective protection to our marine in the foreign trade. It is many years since it was clear to my mind that any passage for vessels through Panama or Nicaragua, under our control, should be furnished with conditions favoring our own flag. For some time it seemed likely that Col. Eads would succeed in getting his ship railway enterprise under way that congress never appeared ready to aid him, as it might well have done. I once reported favorably on the project and plans, and recommended strongly that the charter sought from congress contain provisions that the charges to vessels engaged in our foreign trade be fixed at a minimum, while the maximum should be paid by vessels not of our flag. The last bill of Col. Eads before congress actually contained the discrimination suggested, having the full endorsement of his prominent engineer-in-chief, Mr. E. L. Corthell. It was presumed that this provision would facilitate the passage of the charter bill, but congress did not appreciate either the need of Eads' enterprise or of protection to American shipping.

In the case of the Panama canal the liberality and generosity of our government has been such, that we are now bound up in a treaty with Great Britain, that ancient antagoniser of American shipping power, to charge vessels of foreign flags no more for tolls than we do our own craft. We can make no discrimination whatever for our own advantage. When we reflect that the British government owns the controlling interest in the Suez canal, and, at any time after our Panama canal is in operation, may pass an act to buy up the minority of stock and thenceforth charge no tolls to British vessels, while we must charge tolls to our ships, or make the canal free to all nations, we may conclude our state department lacks a little in the shrewdness that rules every British move connected with navigation.

The way to get rid of this impudent treaty is to annex the new state of Panama. Then the canal passing through our own national territory, it will cease to have relevancy and become waste paper. Then congress can make the canal protective, as it should have been determined from the first.

WILLIAM W. BATES.

## COLLISION WITH A WHALE

The Oceanic Co.'s steamer Mariposa which has just arrived at San Francisco, Cal., from Tahiti island, had a most exciting experience on the incoming voyage. When in latitude 4.54 south, and longitude 144:40 west, the steamer was moving eastward under a full head of steam. Suddenly the big vessel collided with some hidden object, causing a very perceptible shiver from stem to stern. For a few moments there was a panic among the many passengers who were at a loss to determine what had occurred. The vessel's officers were fearful that they had struck an uncharted rock.

The steamer was quickly stopped and moved slowly back toward where the supposed object was located. They soon reached an area where the surface of the water was covered with oil and blood. Several large pieces of whale's flesh and blubber were also found floating.

These discoveries explained the mystery of the severe shock to the steamer. Evidently, the Mariposa had ran afoul of a monster whale. Probably the whale was asleep, or had accidently came in contact with the rapidly moving steamship. From every appearance, the whale had been struck by the propeller, and must have been killed outright.

For a time it was feared that the vessel had sustained damage and as careful an examination as was possible under the circumstances was made. Finding everything apparently all right, the steamship stood on her course, and the excitement on board subsided.

Before steaming outward again the Mariposa will be carefully inspected, and if found necessary, will be placed in dry dock.

## FROM AN OLD TIME SUBSCRIBER

Editor Marine Review: I have today renewed my subscription to the Marine Review. You say you have been endeavoring to make the paper interesting, in which I heartily agree with you; although I have never been directly interested in navigation, yet I have always taken a great interest in it. I have been a subscriber to the Review now continually since July, 1890, and must be one of your oldest steady subscribers the paper starting about March 1st, 1890, I believe. I have carefully preserved every number since I have been a subscriber, and will get them bound sometime I believe. Since the last fifteen years, navigation on the lakes has made greater bounds both as to size of boats, and also the tonnage carried from port to port. It seems but a short time since the Pontiac carried the largest load, about 3,000 tons iron ore in 1889, and the idea of such a load being carried as the Augustus B. Wolvin is able to carry, would have been ridiculed. I believe there is no district in the world in which greater strides have been made than on the great lakes, and it is hard to guess where it will stop. I am glad to see the subjects so well covered by the Review, and I hope to be a subscriber for a long time yet.

Milwaukee, Oct. 1. HERMAN G. RUNGE.

## BELLVILLE BOILERS IN THE FURIOUS

The French cruiser Furious of 5,000 H. P. lately terminated at Cherbourg a series of official experiments to the complete satisfaction of the reviewing commission. The Furious was launched in 1883 and had its first trial in 1887. The boilers at that time were of the cylindrical type. The installation of Belleville boilers was made a part of the program of the general remodeling of the Furious later. The following table permits of the judging of the economy resulting from the installation of the Belleville boilers:

| | 1887. Cylindrical boilers. | 1901. Belleville boilers. |
|---|---|---|
| 1. Experiment at reduced pressure. Consumption of coal per horse power per hour | During 4 hrs. 1172 gr. | During 6 hrs. 698 gr. |
| 2. Experiment of 24 hours Consumption of coal per horse power per hour... | During 8 hrs. 1025 gr. | During 24 hrs. 852 gr. |
| 3. Experiment at maximum pressure. Consumption of coal per horse power per hour ..... | During 2 hrs. Under forced draft. 1231 gr. | During 4 hrs. 915 gr. |

The steamer Progress in going down the Maumee river with the Tasmania in tow was considerably damaged in a collision this week. The Progress ran aground and the Tasmania crashed into the steamer's stern with great force. Both steamers were light and sufficient repairs were effected to permit them to continue on their journey.

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## LIVERPOOL SHIPPING LETTER

Liverpool, Oct. 10.—Messrs. H. E. Moss & Co. of Liverpool, London, and Newcastle-On-Tyne, the well-known firm of ship brokers and auctioneers, have just issued their semi-annual steamship circular, and it contains one or two paragraphs which will be of interest to your readers. Dealing with the depressed state of Britain's shipping trade Messrs. Moss & Co. say: "We may safely say that the last six months have been the worst experienced for a decade past, caused mainly by the over-supply of very large carrying steamers, and the great falling off in exports to Europe from the United States of America, which country appears now to require the bulk of what she grows for home consumption. If America cannot supply the wants of our ever-increasing population it may prove a blessing in disguise to British ship owners, and what we cannot get from the United States we must bring from Canada, India, Australia, Argentine, and other distant countries." Touching upon the future of Britain's shipping trade, the circular further says: "As we write there is a decided improvement in homeward freights especially, but outward employment is sadly lacking in all directions, but there is no disguising the fact that there is a better feeling, and the value of produce is appreciably increasing, which is generally the forerunner of improved business for ship owners. We do not, however, anticipate that there will be any marked advance before 1906, and then gradual, unless the war in the Far East is brought to a sudden close, and this, unfortunately, at the present moment, does not appear to be likely for some considerable time. When it does end, we anticipate (as happened after the Franco-German war, and history general repeats itself) a great improvement, such as we have not seen before for many years, especially in the Pacific trade, which we have always predicted is capable of enormous expansion. For the first eight months of this year 421 vessels were launched from yards in the United Kingdom, of a gross tonnage of 784,647 tons, which does not so far show a much greater diminution in the amount of tonnage building, as many vessels contracted for at the beginning of the year have yet to be put in the water, but by the end of the year we are of opinion that through the cessation of orders the returns will show a much greater decline for the whole twelve months. The demand for second-hand tonnage has been very poor, and prices are abnormally low. The fall in the value of new steamers, and reduction in the cost of construction have been most marked. We may say that the difference from the highest to the lowest during the last four years has been fully 30 per cent, and new steamers can now be built at almost the lowest price they have ever reached, and if we are not at the bottom, we cannot be far off it. It may be that wages may yet be reduced another 5 per cent, thus bringing them to the minimum, below which it is impossible to reduce, and the cost of steel may also be somewhat lower, but these items cannot make much appreciable difference in the cost of a new steamer. The latest feature in the steamship world is the adoption of the turbine system by the Cunard and other large companies, especially for fast passenger steamers, and we have no doubt but that this system will be adopted to a great extent for passenger boats of over 15 knots in the near future."

There is just now taking place in Britain a great awakening as to the value of canals which is no doubt due to the exorbitant charges of the railway companies. Within the last few days the question of making the canals of this country of more use commercially has been considered at some length by the associated Chambers of Commerce of Manchester, but the resolution to place the whole of the British canals under a public trust, which should have a guarantee from and be under the supervision and control of the government was defeated, only forty chambers voting in favor and sixty chambers against. But the chambers of Liverpool, Manchester and other important industrial centers having taken this movement in hand it will not be allowed to drop until some scheme of reorganization and uniformity of working has been devised and put into operation. The great drawback to canal traffic in Britain is the limited size of the boats using the canals, for, according to the last available returns published by the Board of Trade, it appears that out of a total of 4,000 miles of canals in this country, only 230 miles will permit of boats of 90 tons passing; 2,000 miles, boats of 60 tons; and the remaining 1,770 miles boats of only 18 tons can be used. This of course only refers to barge canals. Britain in this matter is placed at a great disadvantage with the continental countries of Europe, for there the majority of the inland waterways are capable of accommodating boats up to 1,000 tons. That British canals are not used to the extent they might be is evidenced by the fact that they only carry about 30,000,000 tons annually, whereas the railways in the country carry over ten times this tonnage of minerals alone. What is required is a scheme for making the canals capable of accommodating a large class of boat, and an up-to-date method of working the boats, for there is hardly room to doubt that when these two questions are settled, the inland waterways of this country will be put on a more commercial and profitable basis. Meanwhile the development of the scheme taken in hand by the Liverpool Chamber of Commerce, in conjunction with the Manchester and Worcester chambers for amalgamating the canals around Manchester will be watched with interest by commercial men in all centres touched by the canals included in the scheme.

The Manchester Ship Canal Co. has just issued a circular letter to 900 Lancashire cotton spinners calling attention to the arrangements which have been made for direct steamer services to Manchester from the various cotton ports this season. There will be regular sailings from Galveston, New Orleans, Brunswick, Savannah, Boston, New York and Philadelphia, as well as from Alexandria. The letter continues: "The company have done there part by providing adequate accommodation for the efficient handling of the cotton on arrival at the Manchester docks. The chairman feels convinced that spinners will appreciate all these preparations, by means of which they can secure the advantages and savings connected with the importation of cotton by steamers coming direct to Manchester. There is abundant testimony to the fact that the direct Manchester importation arrive at the mills in better condition than the importations via Liverpool. The canal company, in addition to the very heavy capital expenditure incurred in the construction of the existing first-class dock accommodation, are now expending half a million pounds sterling in constructing a new dock, with enormous transit shed accommodation, fitted up with all the most modern appliances for the efficient handling of cotton and other cargo. The new dock will be ready for work next summer. We believe that you will realize that it is most important that the whole trade should be determined to give their persistent support to the direct sailings to Manchester, not only the expansion but the maintenance of the lines of steamers will depend upon the spinners insisting on direct sailing to Manchester whenever they purchase cotton for importation. With such an abundant supply of tonnage on all the berths there is and will be no excuse for sellers hesitating to promise this condition.

In this connection the arrangement entered into last cotton season between the Manchester Liners, Ltd., and the Leyland Line, has been renewed for the coming season. The steamers of the two companies will be loaded at New Orleans by the Leyland Line, whilst the Manchester liners will act as agents in Manchester for the joint service. The first steamer to be loaded under this arrangement this season will be the Leyland Line steamer, Cuban, now at New Orleans, and which is expected to sail for Manchester about the middle of October. She will be followed by other first class steamers at short intervals as required by the trade.

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Reference to the Manchester Liners, Ltd., reminds me of the statement made by Sir Christopher Furness, the chairman at the annual meeting of shareholders held recently, to the effect that the directors intended to maintain at all hazards the service it has inaugurated between Manchester and the River Plate, notwithstanding the powerful opposition which the Liverpool conference lines are exercising, and which so far has been fairly successful in retaining all important shipments to the conference lines. Of course the Manchester liners are quite within their rights in making a bid for a share of the River Plate trade from their headquarters—Manchester—but they must fight for it, as the lines in the conference appear determined not to let them get it if they can prevent it.

Having secured so marked an advantage in the North Atlantic struggle, and holding the strongest of positions in regard to the Adriatic business, the Cunard company have a splendid opportunity now for striking a blow at their continental competitors, which they do not seem inclined to miss. The only question seems to be in which direction will they extend their business so as to capture more of the trade which has been monopolized by the Germans. It has been stated that there was a probability that the company would run direct steamers from Scandinavia, but seeing that already the bulk of the Scandinavians travel to America via Liverpool, and are largely carried by the Cunard steamers, this idea does not seem likely to be carried out. The latest statement that the next move of the Cunard will be to start, in the spring, weekly sailings from Dover, as the Hamburg-American Line is running now, seems the most probable direction in which developments will take place. In fact, there is reason to believe that Cherbourg and Boulogne will be made ports of call, so that the company will make all the connections now maintained by the German and the shipping trust craft. Naturally this departure would be forcing great inroads into the traffic of the continental lines, and hence developments are awaited with the keenest possible interest.

At the time of writing an official announcement is made that the White Star Line have reduced their first-class rates from Liverpool to New York from $75 to $60, this being a difference of $15 in the minimum for this class. Hitherto the rate cutting has been confined to third class fares for the westward voyage, and the new departure of the White Star Line practically reopens the struggle, which it was hoped was drawing to a close. That this reduction will affect other lines is almost certain, and it will surprise no one if a severe struggle does not now ensue over the saloon rates. The report that the International Mercantile Marine Co. were likely to change their port of call from New York to Montreal owing to the dock dues, has been discussed in Liverpool shipping circles, but no reliance is placed on the information.

I learn that excellent progress is being made with the two turbine express Cunarders which are being built on the Clyde and the Tyne. The floors are up and the frames soon will be, the work on the Tyne ship being slightly in advance of the other. It is stated that the steamers are being so constructed that they can be fitted with the ordinary type of engine as well as the turbines.

In view of the increased quantity of live stock now coming to Manchester by the direct steamers from Canadian and North American ports, the Manchester corporation have decided to increase the capacity of the foreign animal wharves and lairages at Mods Wheel and accommodation will shortly be available for an additional 800 head of cattle.

Mr. J. W. Bailey, one of the best known pursers of the Cunard Line has just retired. Mr. Bailey, who has been over 47 years with the Cunard company, has had a notable career, and on one occasion his ability and pluck obtained for him recognition from the committee of Lloyd's as well as from his employers.

## AN INTERVIEW WITH MR. WINTHROP L. MARVIN

Winthrop L. Marvin, secretary of the Merchant Marine Commission, is at present in Washington analyzing and putting into proper shape the great volume of testimony submitted to the commission by merchants and manufacturers, ship owners and ship builders during its recent tour of the continent. In an interview Mr. Marvin said:

"The inquiry which the commission is charged by congress to undertake is not yet completed. An important part remains—the chief hearings in the South Atlantic states and the Gulf of Mexico. These meetings will be held immediately after the November election, opening probably at the port of Galveston. It is the plan of Senator Martin of Virginia, chairman of the southern sub-commission, to go from Galveston to New Orleans, Mobile, Pensacola and thence to the Georgian and Carolinan ports, ending the series at Newport News, Va.

"It is likely that a hearing will be given also in Washington to officials of the navy and post office departments with regard especially to the naval reserve and ocean mail aspects of this large question of the merchant marine. Moreover, the commission is not unmindful of the desire that has been expressed for a further hearing in New York city. One volume of the testimony taken at the hearings—those on the North Atlantic coast—has already been published, and a second volume, containing the text of the hearings on the great lakes and the Pacific seaboard, is nearly ready for the press. These hearings on the lakes and the Pacific proved to be exceedingly valuable, bringing out a great deal of fresh testimony not only from ship owners and builders but from merchants and manufacturers interested in the export trade, who declared out of their personal experience that the present lack of American shipping is a grave handicap upon their efforts to secure new markets.

"One especially significant point of the long inquiry of the commission is that the American mercantile community, west as well as east, appears to be absolutely unanimous in demanding that congress take immediate and aggressive steps for the upbuilding of an American merchant fleet in overseas commerce. The idea that finds editorial expression in some newspapers, that the loss of our ships, our ship yards, our splendid sailors and skilled workmen is a matter of no particular concern, and that if foreigners through cheap wages or subsidies, or both combined, can drive our ships off the ocean they ought to do so, has no reflection in the sentiment of American business men, or at least of the hundreds of American business men who have appeared before the Merchant Marine Commission.

"A few agents or employes of foreign steamship companies have had the assurance to suggest to the commission that they were eminently satisfied with things as they are—and well they may be. But every witness before the commission whose interests were on this side of the ocean has taken as the fundamental proposition of his testimony that the United States must have a great and prosperous merchant marine to advance its trade in peace and help to defend its coasts in war. This thought was voiced as emphatically on the great lakes as on the Atlantic coast and perhaps most emphatically of all on the Pacific coast.

"As to specific methods, there was the same significant agreement at the Pacific as at the Atlantic ports, that the present ocean mail act of 1891 should be revised, broadened and strengthened so as to increase our fleet of steamers available as auxiliary cruisers and transports, and to develop regular lines of mail and cargo steamers to distant markets, especially South America, Africa and Asia. But I think the commission is disposed to give much regard to the interests of what may be called the rank and file of a merchant marine—the sail vessels and steam tramp freighters. For the encouragement of this useful tonnage some ingenious plans

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have been presented to the commission. The policy most favored by the witnesses seems to be some form of differential customs duty applied at least in the indirect trade or against foreign ships bringing goods from countries other than their own. On the other hand some earnest opposition to this policy has developed in the Northwest, where other methods seem to be preferred, as it is feared that this would bring retaliation.

"The free ship expedient, of which very little was heard on the Atlantic, was, I think, ignored at the great lakes hearings and advocated only conditionally on the Pacific. A few Pacific witnesses favored the free registry of at least sailing vessels, exclusively for the foreign trade, but held that regular liners should be built in America. The president of the Shipowners' Association of the Pacific coast suggested free sailing ships for the foreign trade and coupled with this an argument for discriminating duties for the benefit of American-built ships alone. The commission has taken pains to ask practical ship owners whether they would avail themselves of a free ship opportunity if this were offered without national aid of some kind, and with only a very few exceptions to prove the rule these practical men have replied that free ships without national aid would be sure to be ineffective and disappointing.

"The action of the British government in requiring that the new Cunarders shall 'be built in the United Kingdom,' and the German requirement that steamers receiving the Imperial mail subsidy shall be constructed in German yards by German workmen, seem to have had an effect upon mercantile opinion in America. Moreover, the fact that France and Italy both tried free ships long in vain before resorting to their present clumsy subsidy and bounty systems has been recalled before the Merchant Marine Commission. And it has been pointed out also that even Norway, in apparent disappointment with her free ship law, has fallen back on government bounties to ship yards in a tardy attempt to save her native ship building.

"From free ships all foreign nations—and Japan must not be forgotten—appear to have drifted into some form or degree of subsidy, or bounty, or natural encouragement. 'Why,' witnesses have asked the commission, 'should the United States adopt the free ship policy, which by itself alone has been sufficient nowhere?' This appears to explain the slight estimate put upon the free ship expedient by the mercantile community.

"A new and fresh point developed on the Pacific coast is the demand of the merchant shipping interests there that the United States government shall no longer be a competitor of the country's merchant marine; and that the transport service, amounting to several million dollars a year in freight business alone, should now be performed in these times of peace by merchant ships and seamen. This is the policy of Great Britain, Germany and other maritime powers."

## TRADE NOTES

The Abendroth & Root Mfg. Co., Newburg, N. Y., has just issued a condensed price list of the Root spiral rivet pipe, Root sectional water-tube boilers and Abendroth & Root exhaust heads. It will be sent to anyone upon request.

The Kitts Manufacturing Co., manufacturers of steam specialties, has recently been incorporated and is now doing business under new management. The officers of the company are: W. A. Kitts, president; W. A. Kitts, Jr., vice-president; G. W. Kirk, secretary and treasurer.

The American Steel & Wire Co. has just issued a little pamphlet devoted to American wire rope of every description. A full descriptive catalogue of the various makes for every conceivable purpose will be sent to anyone upon request. The Chicago office of the company is in the Rookery building.

W. H. Mullins, manufacturer of stamp steel row boats, Salem, O., intends putting upon the market next season several new boats, chief among them being a 16 and 18-ft. stamp steel launch. Mr. Mullins believes that they will be world beaters. There is a great demand for small power boats and those constructed of steel which seem to have great advantage over wooden launches. The catalogue which Mr. Mullins is preparing will contain full descriptions of these launches.

The Joseph Dixon Crucible Co., Jersey City, N. J., have just issued a pocket size circular concerning the lubrication of axles in which three facts given are worthy of thought. The first fact is that the smoother the bearing surface the easier they are to lubricate; the second fact is that all metal surfaces, no matter how smooth they may appear, are full of irregularities; and the third fact is that Ticonderoga flake graphite is the smoothest and when introduced in bearings fills up all the microscopic irregularities, making the surface very smooth. Its use is a guarantee against cutting or overheating.

The Detroit Graphite Mfg. Co., Detroit, Mich., has just issued a little bulletin entitled "A Lesson from the Baltimore Fire." It is the picture of the Union Trust building of Baltimore, Md., after the fire. While the terra cotta and brick covering were destroyed by the intense heat, the steel structural part of the building is absolutely intact. Of particular interest is the condition of the paint upon the steel. Its appearance would indicate it to have been recently applied instead of during the year of construction, 1897-98. It is glassy, free from cracks and adheres firmly to the metal. There is no evidence whatever of corrosion. The company concluded that the condition of this building is a striking evidence of the excellence of Superior Graphite paint.

The manufacturer who contemplates installing motors for driving his machinery or machine tools, either individually or in groups, will find much valuable information on the subject in a paper recently read by Mr. Charles Day before Section "B" of the International Electrical Congress recently held at St. Louis. Mr. Day is a member of the firm of Dodge & Day, engineers. The subject is one to which they have devoted much time and study, as evidenced not only by this recent contribution but Mr. Day's other very able papers along the same line, "The Requirements of Machine Tool Operation with Special Reference to the Motor Drive," read before the New York Electrical Society, and "The Machine Shop Problem," read before the American Society of Mechanical Engineers. The large number of motor layouts this firm has made in the past few years and the installations they have engineered has given them a wide range of experience. The paper will probably be reprinted and can be had upon application to Dodge & Day, Philadelphia, Pa.

## PERSONAL

G. A. Ritchie has been appointed superintendent engineer of the Metropolitan Steamship Co. of New York to take the place of Walter Barr, deceased.

Messrs. Karl Konow and H. Krell, prominent engineers and naval architects of the construction department of the Imperial German navy, are at present in the lake district inspecting the lake ship yards and the plants for the rapid handling of bulk freight. Messrs. Konow and Krell have made a comprehensive tour of the country with especial reference to their profession and report themselves as well satisfied with their trip.

The steamer Superior City of the Pittsburg Steamship Co.'s fleet was damaged at Port Huron this week by collision with a whaleback. The Superior City attempted to pick up the barge of the Edenborn, which had a cable in her wheel, and in making the turn the Superior City ran against the nose of the pig. The whaleback was damaged about the bow and a hole several feet long was torn in the steamer's starboard quarter about 6 ft. above the water line.

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***Just a suggestion at a time when many ORDERS are being placed for NEW LAKE VESSELS:***

All the world over the insurance of ships depends upon the character that is given to them in reputable societies for the classification of ships. The same must ultimately be true of lake ships. To honestly class lake ships, safeguarding the interests of both owner and underwriter, is the first mission of the Great Lakes Register—a mission not lost sight of through numerous changes in dimensions and methods of construction.

THE GREAT LAKES REGISTER,
F. D. HERRIMAN, Surveyor-General,
PERRY-PAYNE BLDG.,
CLEVELAND.

***ESTABLISHED 1896.***


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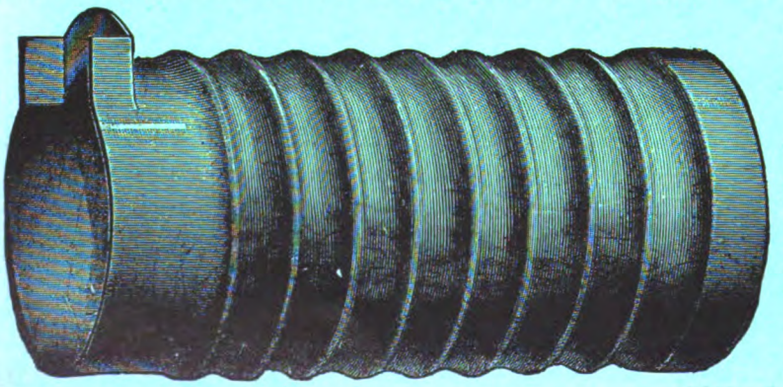

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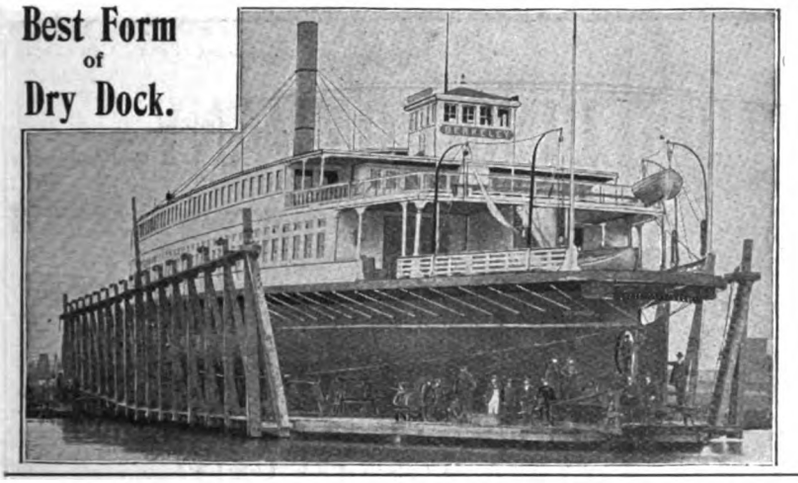


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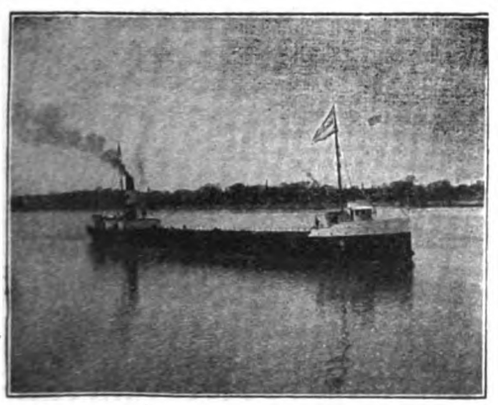

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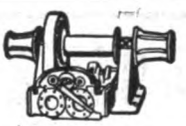

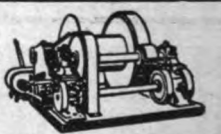

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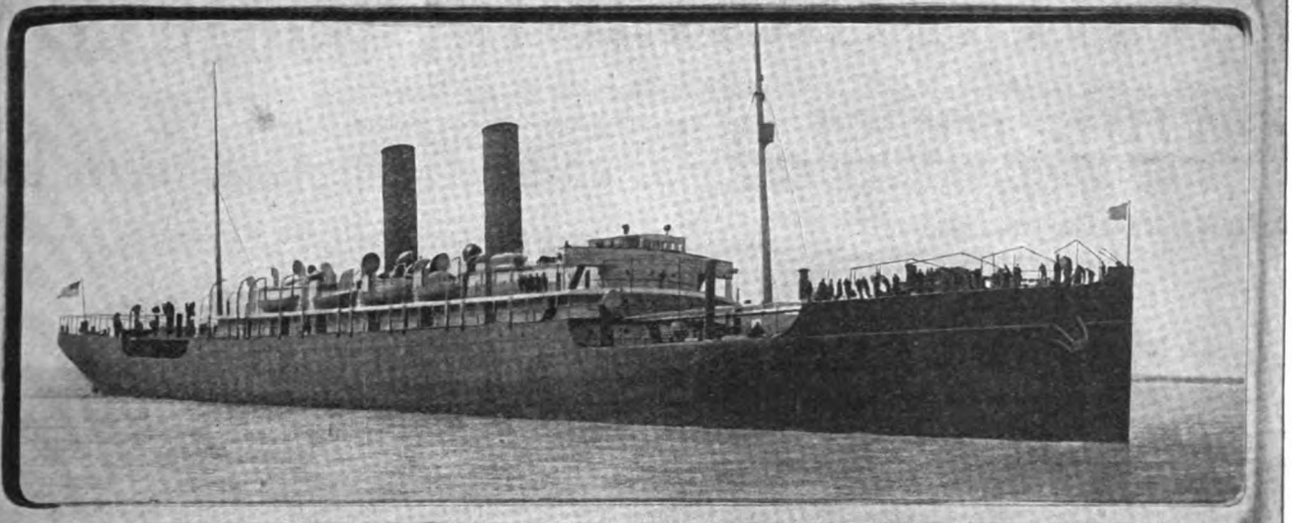

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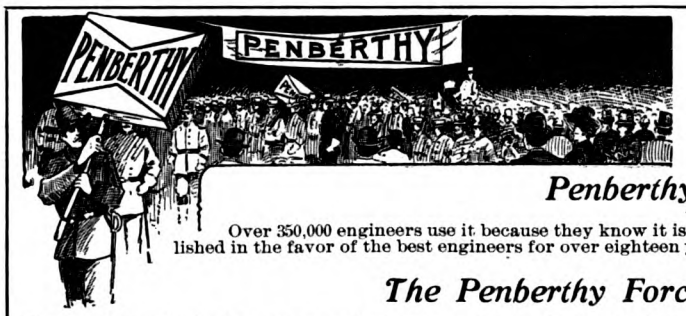


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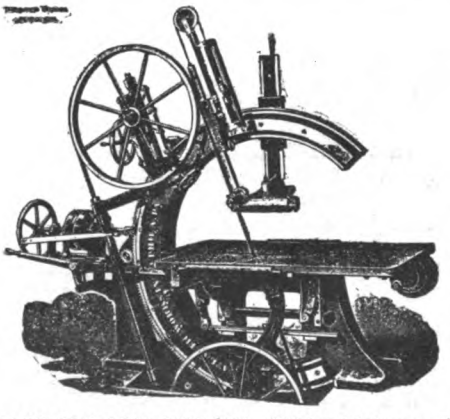

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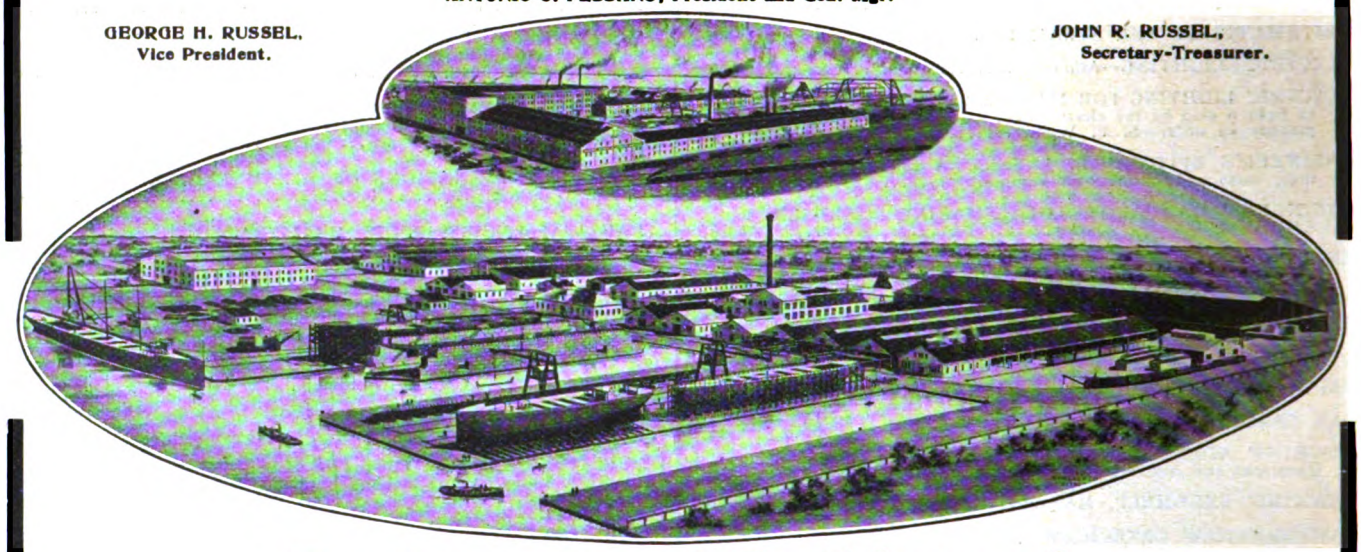

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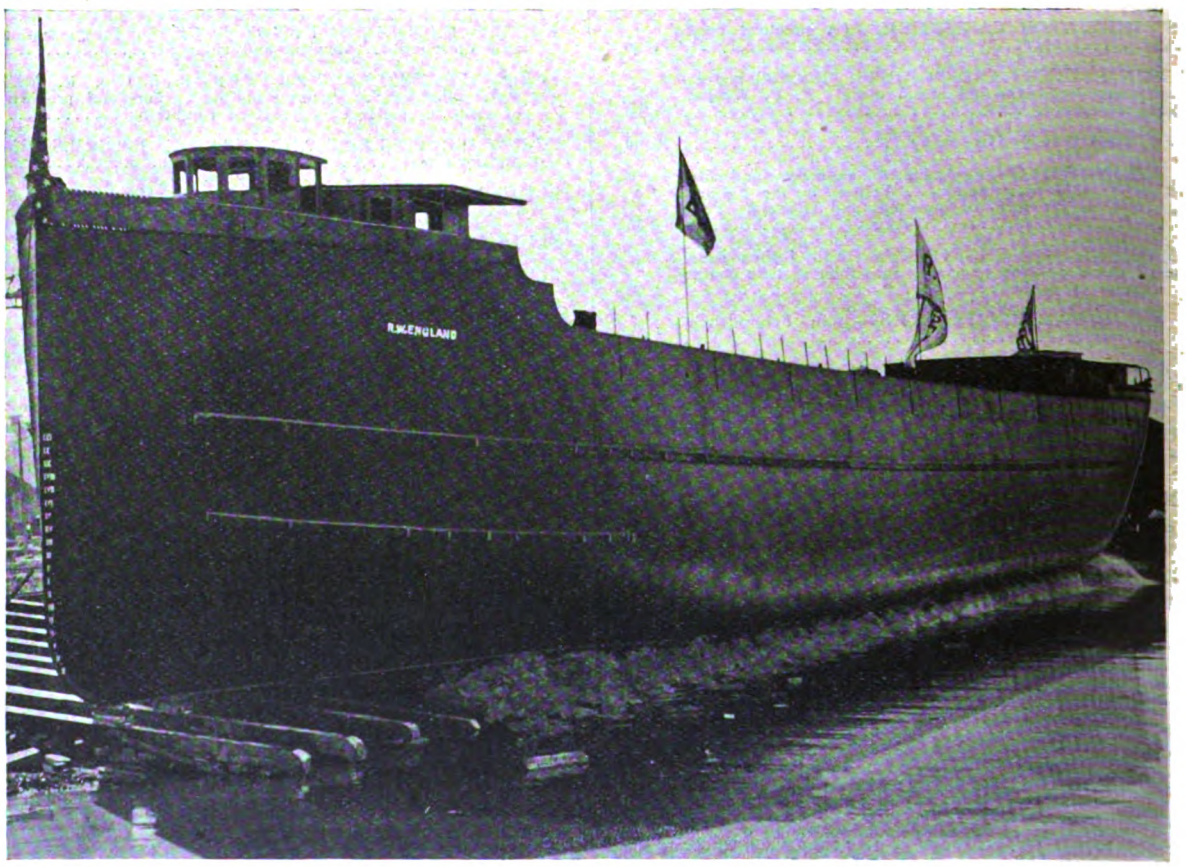


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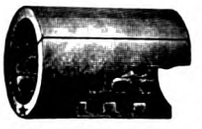

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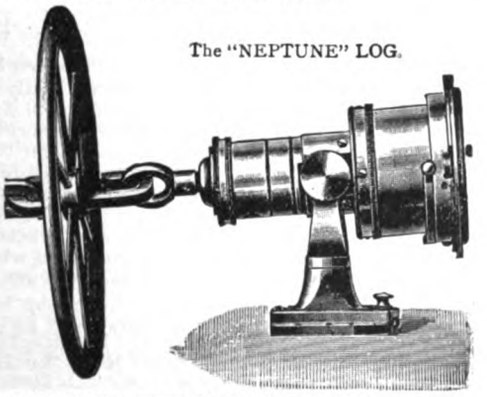

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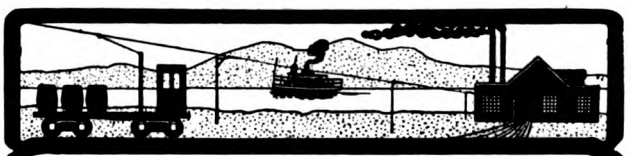

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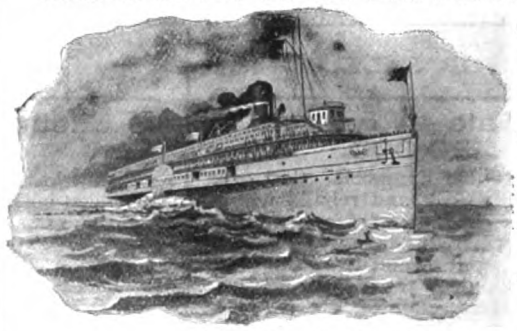

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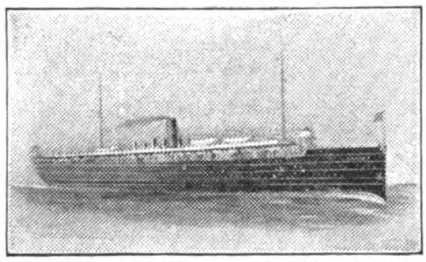

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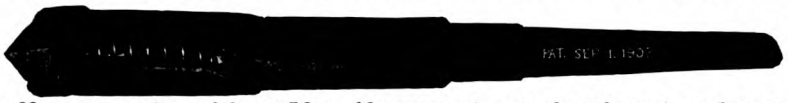

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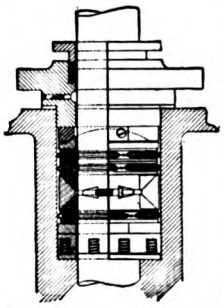

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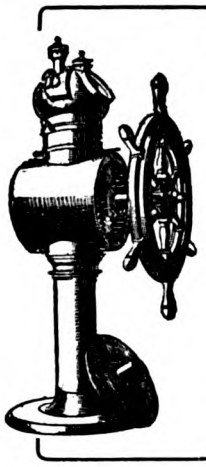

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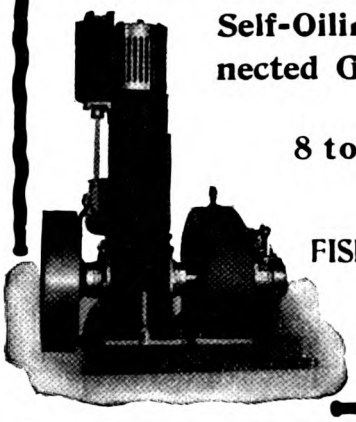

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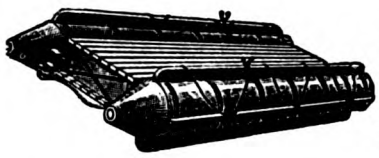

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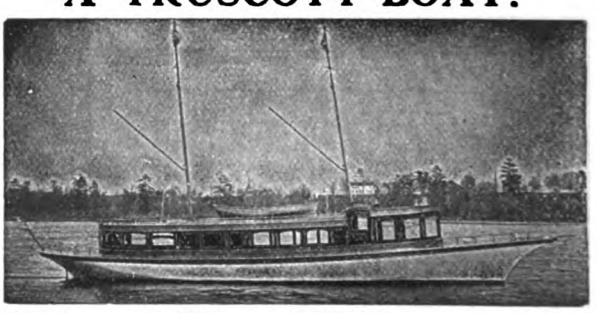

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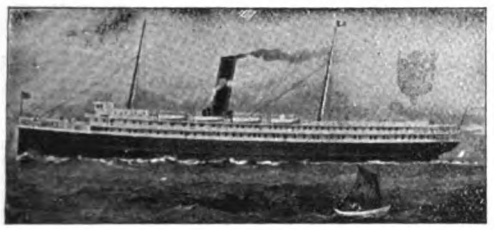

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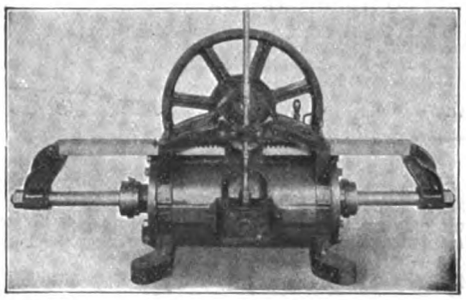

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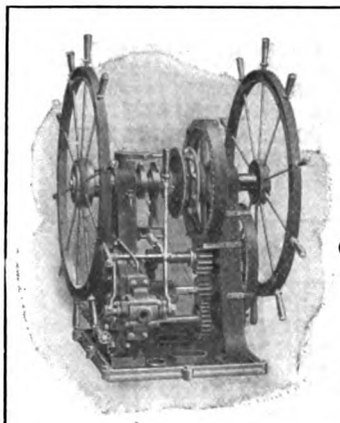

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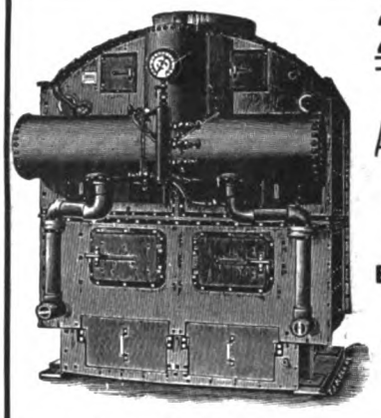

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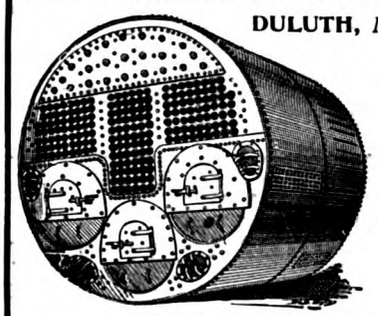

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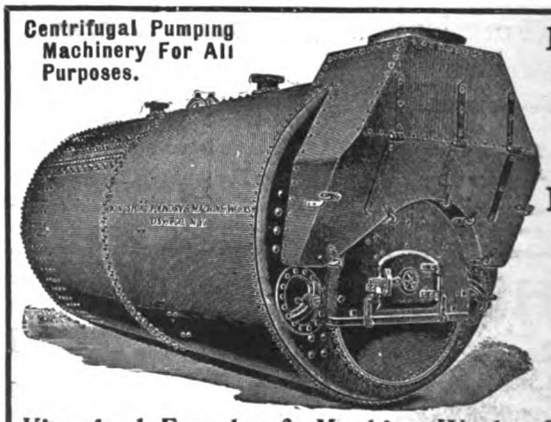

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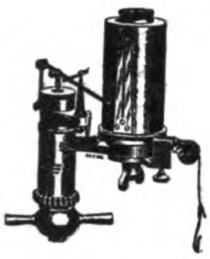

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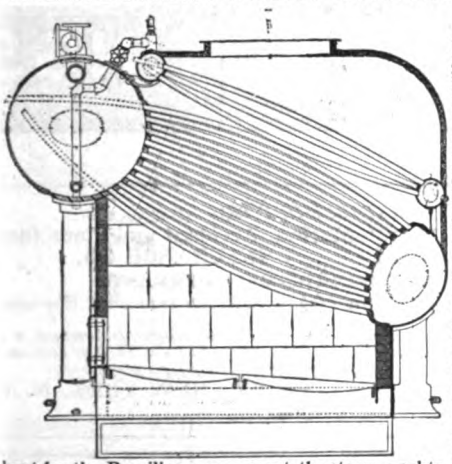

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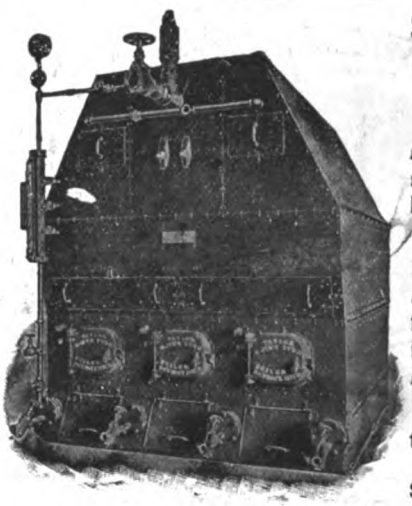

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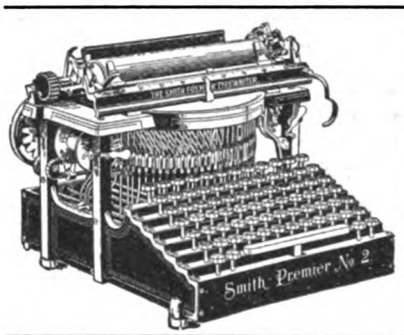


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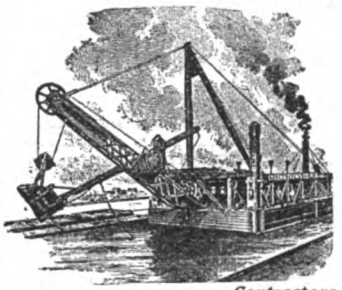

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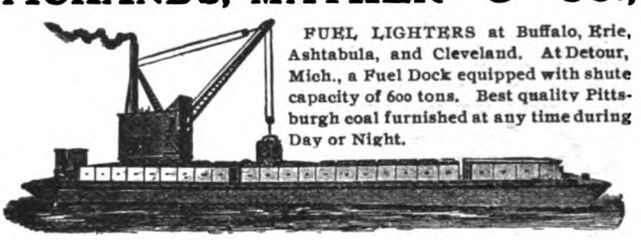

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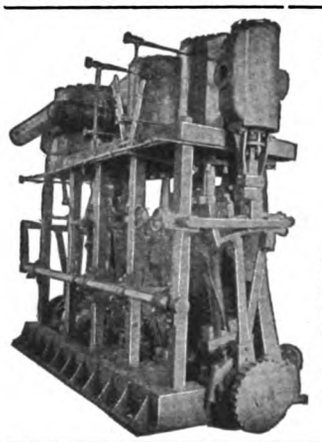

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Delauney, Belleville & Co..St. Denis, France.
Detroit Ship Building Co.....Detroit.
Fletcher, W. A. & Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass
Forest City Boiler Co.....Cleveland.
Georgian Bay Engineering Works.....
..... Midland, Ont.

BOILER MANUFACTURERS—Continued.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co....Port Huron, Mich.
Kingsford Foundry & Machine Works....
.....Oswego, N. Y.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher Water Tube Boiler Co....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
Northwestern Steam Boiler & Mfg. Co....
..... Duluth, Minn.
Roberts Safety Water Tube Boiler Co....
..... New York.
Stirling, The Co.....Chicago.
Superior Ship Building Co....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.
Union Machine & Boiler Co.....Cleveland.
United States Ship Building Co....New York.
Willard, Chas. P. & Co.....Chicago.

### BOILER RIVETS.
Bourne-Fuller Co.. ..... ....Cleveland.

### BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.

### BRASS AND BRONZE CASTINGS.
Cramp, Wm. & Sons.....Philadelphia.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lunkenheimer Co. .....Cincinnati.
Macbeth Iron Co.....Cleveland.
Phosphor Bronze Smelting Co....Philadelphia.
Victor Metals Co.....Braintree, Mass.

### BRIDGES, BUILDERS OF.
Scherzer Rolling Lift Bridge Co....Chicago.

### BUCKETS, ORE AND COAL.
Brown Hoisting & Conveying Machine Co.
..... Cleveland.
Forest City Boiler Co. .....Cleveland.
Macbeth Iron Co. .....Cleveland.

### CABIN AND CABINET FINISHING WOODS.
Martin-Barriss Co.....Cleveland.

### CAPSTANS.
American Ship Windlass Co..Providence, R. I.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.

### CEMENT, IRON FOR REPAIRING LEAKS.
Smooth-On Mfg. Co.....Jersey City, N. J.

### CHAINS.
Lebanon Chain Works.....Lebanon, Pa.

### CHAIN HOISTS.
Boston & Lockport Block Co....Boston, Mass.
Dake Engine Co.....Grand Haven, Mich.

### CHARTS.
Penton Publishing Co. .....Cleveland.
Potter, J. D.....London.

### CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.
Ashton Valve Co.....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

### COAL PRODUCERS AND SHIPPERS.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.

### COAL AND ORE HANDLING MACHINERY.
Brown Hoisting Machinery Co. (Inc.) ..
..... Cleveland.
Macbeth Iron Co.....Cleveland.

### COMPASSES.
Ritchie, E. S. & Sons.....Brookline, Mass.

### COMPOSITIONS FOR SHIP'S BOTTOMS.
Holzapfel's American Compositions Co.New York.

### CONCRETE MIXERS.
Contractors Supply & Equipment Co..Chicago.

### CONDENSORS.
Great Lakes Engineering Works.. Detroit.
Thropp & Sons Co., John E....Trenton, N. J.

### CONTRACTORS SUPPLIES.
Contractors Supply & Equipment Co., Chicago.

### CONTRACTORS FOR PUBLIC WORKS.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co..
.....Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M. .....Detroit.

### CORDAGE.
Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

### CORK JACKETS AND RINGS.
Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.

### COURSE FINDER.
Field's Patent Course Finder.....Cleveland.

### CHAIN CONVEYORS, HOISTS.
Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### CRANES, TRAVELING.
Brown Hoisting Machinery Co.....Cleveland.
Pawling & Harnischfeger.....Milwaukee.

### DIVING APPARATUS.
Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

### DREDGING CONTRACTORS.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co..
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dregding Co..
.....Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H...Milwaukee.
Sullivan, M. .....Detroit.

### DRYING APPARATUS.
Sturtevant, B. F., Co.....Hyde Park, Mass.

### DRY DOCKS.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co....Superior, Wis.
United States Ship Building Co....New York.

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# Buyers' Directory of the Marine Trade.—*Continued.*

### ELECTRIC HOISTS AND CRANES.
Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Pawling & Harnischfeger.....Milwaukee.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

### ELECTRIC LIGHT AND POWER PLANTS.
Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Mietz, Aug. .....New York.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

### ENGINE BUILDERS, MARINE.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd. .....
..... Toronto, Can.
Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works Detroit, Mich.
Hall Bros. .....Philadelphia.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Mietz, Aug. .....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
Northwestern Steam Boiler & Mfg. Co....
.....Duluth, Minn.
Roach's Ship Yard .....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.
United States Ship Building Co....New York.
Willard, Chas. P. & Co.....Chicago.

### ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.
Cory, Chas. & Son.....New York.
Marine Mfg. Supply Co.....New York.

### ENGINE TESTING.
Kreer & Parsons..... Chicago.

### ENGINEERING SPECIALTIES AND SUPPLIES.
Crane Co.....Chicago.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
New York Belting & Packing Co..New York.
Northwestern Steam Boiler & Mfg. Co....
.....Duluth, Minn.

### ENGINEERS, MARINE, MECHANICAL, CONSULTING.
Hynd, Alexander .....Cleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, Joseph .....Duluth, Minn.
Kreer & Parsons.....Chicago.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Pittsburg Testing Laboratory, Ltd...Pittsburg.
Rice, Henry .....Buffalo.
Roelker, H. B.....New York.
Sadler, Perkins & Field.....New York.
Steel, Adam .....Cleveland.
Wood, W. J. .....Chicago.

### FANS FOR VENTILATION, EXHAUST, ETC.
Sturtevant, B. F. Co.....Hyde Park, Mass.

### FEED WATER PURIFIERS AND HEATERS.
Reilly Repair and Supply Co., Jas.....New York.
Ross Valve Co.....Troy, N. Y.

### FIXTURES FOR LAMPS, OIL OR ELECTRIC.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### FORGES.
Sturtevant, B. F. Co.....Boston.

### FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.
Cleveland City Forge & Iron Co....Cleveland.
Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

### FLUE WELDING.
Fix's, S. Sons .....Cleveland.

### FUEL ECONOMIZERS.
Sturtevant Co., B. F.....Hyde Park, Mass.

### FUELING COMPANIES AND COAL DEALERS.
Hanna, M. A. & Co.....Cleveland.
Ironville, Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Picklands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B.Toledo, O.

### FURNACES FOR BOILERS.
Continental Iron Works.....New York.

### GASKETS, RUBBER.
New York Belting & Packing Co..New York.

### GAS BUOYS.
Safety Car Heating & Lighting Co..New York.

### GAS AND GASOLINE ENGINES.
Chase Machine Co.....Cleveland.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Reliance Mfg. Co..... Providence, R. I.

### GAUGES, STEAM AND VACUUM.
American Steam Gauge & Valve Mfg. Co.
..... Boston.
Ashton Valve Co.....Boston.
Lunkenheimer Co. .....Cincinnati.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

### GAUGES, WATER.
Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co. .....Cincinnati, O.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

### GRAPHITE.
Dixon Crucible Co., Joseph..Jersey City, N. J.

### HAMMERS, STEAM.
Chase Machine Co.....Cleveland.

### HEATING APPARATUS.
Sturtevant, B. F. Co.....Hyde Park, Mass.

### HOISTS FOR CARGO, ETC.
American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Hyde Windlass Co.....Bath, Me.
Marine Iron Co.....Bay City.
Mietz, Aug. .....New York.
Pawling & Harnischfeger .....Milwaukee.
Westinghouse Electric & Mfg. Co.....
.....Pittsburg, Pa.

### HOLLOW STAYBOLT IRON.
Falls Hollow Staybolt Co...Cuyahoga Falls, O.

### HOSE, RUBBER.
New York Belting & Packing Co..New York.

### HYDRAULIC DREDGES.
Great Lakes Engineering Works.....Detroit.

### HYDRAULIC TOOLS.
Watson-Stillman Co., The.....New York.

### ICE MACHINERY.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

### INDICATORS FOR STEAM ENGINES.
American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.

### INJECTORS.
American Injector Co.....Detroit.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

### INSURANCE, MARINE.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., P. H.....Chicago.
Frankfort Marine, A. & P. G. Ins. Co....
..... New York.

### INSURANCE, MARINE—Continued.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Voss, F. D.....New York.

### IRON ORE AND PIG IRON.
Bourne-Fuller Co.....Cleveland. O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

### LAUNCHES—STEAM, NAPHTHA, ELECTRIC.
Georgian Bay Engineering Works.....
..... Midland, Ont.
Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Chicago.

### LIFE PRESERVERS, LIFE BOATS, BUOYS.
Armstrong, Cork Co.....Pittsburg.
Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D. .....New York

### LIGHTS, SIDE AND SIGNAL.
Russell & Watson .....Buffalo.

### LOGS.
Walker & Sons, Thomas ....Birmingham, Eng.
Also Ship Chandlers.

### LUBRICATING GRAPHITE.
Dixon Crucible Co., Joseph..Jersey City, N. J.

### LUBRICATORS.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

### LUMBER.
Martin-Barriss Co.....Cleveland.

### MACHINISTS.
Chase Machine Co.....Cleveland.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Union Machine & Boiler Co.....Cleveland.

### MACHINE TOOLS (WOOD WORKING).
Atlantic Works, Inc.....Philadelphia.

### MARINE RAILWAYS.
Hickler Bros. .....Sault Ste. Marie, Mich.

### MARINE GLUE.
Ferdinand & Co., L. W.....Boston, Mass.

### MARINE RAILWAYS, BUILDERS OF.
Crandall & Son, H. I....East Boston, Mass.

### MATTRESSES, CUSHIONS, BEDDING.
Fogg, M. W.....New York.

### MECHANICAL DRAFT FOR BOILERS.
American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works ..Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

### MELTING POT AND PAYING LADLE.
(For Paying Seams of Decks with Marine Glue.)
Ferdinand & Co., L. W.....Boston.

### METALLIC PACKING.
Katzenstein, L. & Co.....New York.

### METAL POLISH.
Bertram's Oil Polish Co.....Boston

### MOTORS, GENERATORS—ELECTRIC.
Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Westinghouse Electric & Mfg. Co.....
..... Pittsburg, Pa.

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# Buyers' Directory of the Marine Trade.—*Continued.*

### NAUTICAL INSTRUMENTS.
Ritchie, E. S., & Sons.....Brookline, Mass.

### NAUTICAL SCHOOLS.
Chicago Nautical School. .. ..... ... Chicago.

### NAVAL ARCHITECTS.
Hynd, Alexander .....Cleveland.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons. .....Chicago.
Lovejoy, H. O.....Buffalo.
Matteson & Drake.....Philadelphia.
Mosher, Chas. D.....New York.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Sadler, Perkins & Field.....New York.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

### OAKUM.
DeGrauw, Aymar & Co.....New York.
Stratford, Oakum Co.....Jersey City, N. J.

### OIL ENGINES.
Mietz, Aug. .....New York.

### OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

### PACKING.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Katzenstein, L. & Co.....New York.
New York Belting & Packing Co...New York.

### PACKING TOOL.
Matteson & Drake .....Philadelphia.

### PAINTS.
Baker, Howard H. & Co.....Buffalo.
Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
New Jersey Zinc Co.....New York.
Upson-Walton Co. .....Cleveland.

### PATTERN SHOP MACHINERY.
Atlantic Works, Inc.....Philadelphia.

### PILE DRIVING AND SUBMARINE WORK.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.. ..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros. .....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co., ..... .Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H...Milwaukee.
Sullivan, M. .....Detroit.

### PIPE, WROUGHT IRON.
Bourne-Fuller Co.....Cleveland, O.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.

### PLANING MILL MACHINERY.
Atlantic Works, Inc.....Philadelphia.

### PLATES—SHIP, STRUCTURAL, ETC.
Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.

### PNEUMATIC TOOLS.
Allen, John F.....New York.

### POLISH FOR METALS.
Bertram's Oil Polish Co.....Boston.

### PRESSURE REGULATORS.
Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

### PROPELLER WHEELS.
American Ship Building Co.....Cleveland.
Atlantic Works .... East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincp, Mass.
Great Lakes Engineering Works.. Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
Phosphor Bronze Smelting Co., Ltd..... Philadelphia.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.
United States Ship Building Co....New York.

### PROJECTORS, ELECTRIC.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co..... ..... Pittsburg, Pa.

### PUMPS FOR VARIOUS PURPOSES.
Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works Detroit.
Kingsford Foundry & Machine Works.... ..... Oswego, N. Y.

### PUNCHES, RIVETERS, SHEARS.
Allen, John F. .....New York.

### RANGES.
Russell & Watson .....Buffalo

### REFRIGERATING APPARATUS.
Great Lakes Engineering Works.....Detroit.
Roelker, H. B. .....New York.

### REGISTER FOR CLASSIFICATION OF VESSELS.
Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping.. .....New York.

### REPAIRS—ENGINE AND BOILER.
(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works..... .....Midland, Ont.
Forest City Boiler Co.....Cleveland.

### RIVETING MACHINES.
Allen, John F.....New York.

### RIVETS, STEEL FOR SHIPS AND BOILERS.
Bourne-Fuller Co.....Cleveland, O.

### SAFETY VALVES.
American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

### SAIL MAKERS.
Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.
Wilson & Silsby .....Boston.

### SALVAGE COMPANIES.
See Wrecking Companies.

### SCHOOLS—NAVIGATION.
Chicago Nautical School.....Chicago.

### SEARCH LIGHTS.
General Electric Co.....Schenectady, N. Y.
Westinghouse Electric & Mfg. Co..... .....Pittsburg, Pa.

### SHEARS.
See Punches, Rivets, and Shears.

### SHIP AND BOILER PLATES AND SHAPES.
Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.

### SHIP BUILDERS.
American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd.Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbnilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
Roach's Ship Yard .....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
United States Ship Building Co..New York.
Willard, Chas. P. & Co.....Chicago.

### SHIP CHANDLERS.
Baker, Howard H. & Co.. .....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

### SHIP DESIGNERS.
Kidd, Joseph.....Duluth.
Kreer & Parsons. .....Chicago.
Matteson & Drake.....Buffalo.
Rice & Lovejoy.....Buffalo.
Steel, Nacey & Hynd .....Cleveland.
Wood, W. J.....Chicago

### SHIP LANTERNS AND LAMPS.
Russell & Watson .....Buffalo.

### SHIP TIMBER.
Martin-Barriss Co.....Cleveland.

### SMOOTH-ON COMPOUND, FOR REPAIRS.
Smooth-On Mfg. Co.....Jersey City, N. J.

### STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..Cuyahoga Falls, O.

### STEAM VESSELS FOR SALE.
Gilchrist & Co., C. P. .....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

### STEAMSHIP LINES, PASS. AND FREIGHT.
American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co.....Boston.
Cleveland & Buffalo Transit Co.....Cleveland.
Detroit & Cleveland Line.....Cleveland.
Erie & Western Trans. Co.....Buffalo.
Goodrich Trans. Co.....Chicago.
International Mercantile Marine Co..... Philadelphia.
Manitou Steamship Co.....Chicago.
Mexican-American S. S. Co..New Orleans, La.
New York & Cuba Mail S. S. Co.....New York
Niagara, St. Catharines & Toronto Ry. & Nav. Co. .....St. Catharines, Ont.
Northern Michigan Trans. Co.....Chicago.
Red Star Line .....New York.
Richelieu & Ontario Nav. Co.....Montreal, Can.
United Fruit Co .....Boston.

### STEEL CASTINGS.
Macbeth Iron Co.....Cleveland.
Otis Steel Co.....Cleveland.

### STEERING APPARATUS.
American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co....Port Huron, Mich.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Pawling & Harnischfeger .....Milwaukee.
Sheriffs Mfg. Co.....Milwaukee.

### SUBMARINE DIVING APPARATUS.
Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

### SURVEYORS, MARINE.
Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

### TESTS OF MATERIALS.
Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory, Ltd....Pittsburg.

### TILING, INTERLOCKING RUBBER.
New York Belting & Packing Co...New York.

### TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.
Allen, John F.....New York.
Watson-Stillman Co.....New York.

### TOOLS, WOOD WORKING.
Atlantic Works, Inc.....Philadelphia.

### TOWING MACHINES.
American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

### TOWING COMPANIES.
Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.
Great Lakes Towing Co.....Cleveland.
Midland Towing & Wrecking Co., Ltd.... .....Midland, Ont.

### TRAPS, STEAM.
Kieley & Mueller .....New York.
Lunkenheimer Co. .....Cincinnati.
Sturtevant Co., B. F. .....Hyde Park, Mass.

### TRUCKS.
Boston & Lockport Block Co.....Boston.

### TUBING, SEAMLESS.
Shelby Steel Tube Co.....Pittsburg, Pa.

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# Buyers' Directory of the Marine Trade.—*Continued.*

**VALVES, STEAM SPECIALTIES, ETC.**

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Crane Co. ..... Chicago.
Jenkins Bros. ..... New York.
Kieley & Mueller ..... New York.
Lunkenheimer Co. ..... Cincinnati.
Ross Valve Co. ..... Troy, N. Y.

**VALVES FOR WATER AND GAS.**

Ross Valve Co. ..... Troy, N. Y.

**VARNISHES.**

Detroit Varnish Co. ..... Detroit.
Detroit White Lead Works. ..... Detroit.
New Jersey Zinc Co. ..... New York.
Also Ship Chandlers.

**VENTILATING APPARATUS FOR SHIPS.**

Sturtevant, B. F. Co. ..... Hyde Park, Mass.

**VESSEL AND FREIGHT AGENTS.**

Boland, John J. ..... Buffalo.
Brown & Co. ..... Buffalo.
Elphicke, C. W. & Co. ..... Chicago.
Fleming & Co., P. H. ..... Chicago.
Gilchrist & Co., C. P. ..... Cleveland.
Hall & Root ..... Buffalo.
Helm & Co., D. T. ..... Duluth.

VESSEL AND FREIGHT AGENTS—Con.

Hawgood & Co., W. A. ..... Cleveland.
Holmes, Samuel ..... New York.
Hutchinson & Co. ..... Cleveland.
Lester, S. S. ..... Quebec, Can.
McCarthy, T. R. ..... Montreal.
Mitchell & Co. ..... Cleveland.
Parker Bros. Co., Ltd. ..... Detroit.
Prindiville & Co. ..... Chicago.
Richardson, W. C. ..... Cleveland.
Sullivan, D. & Co. ..... Chicago.

**WATER GAUGES.**

Bonner & Co., Wm. T. ..... Boston
Lunkenheimer Co. ..... Cincinnati, O.

**WIRE ROPE AND WIRE ROPE FITTINGS.**

Baker, H. H. & Co. ..... Buffalo.
DeGrauw, Aymar & Co. ..... New York.
Upson-Walton Co. ..... Cleveland.

**WHISTLES, STEAM.**

American Steam Gauge & Valve Mfg. Co. ..... Boston.
Ashton Valve Co. ..... Boston.
Lunkenheimer Co. ..... Cincinnati.

**WINDLASSES.**

American Ship Windlass Co. . Providence, R. I.
American Ship Building Co. ..... Cleveland.
Hyde Windlass Co. ..... Bath, Me.
Jenks Ship Building Co. ... Port Huron, Mich.
Marine Mfg. & Supply Co. ..... New York.

**WINCHES.**

American Ship Windlass Co. . Providence, R. I.
Georgian Bay Engineering Works. ..... Midland, Ont.
Hyde Windlass Co. ..... Bath, Me.

**WOOD WORKING MACHINERY.**

Atlantic Works, Inc. ..... Philadelphia.

**WRECKING AND SALVAGE COMPANIES.**

Donnelly Salvage & Wrecking Co. ..... Kingston, Ont.
Great Lakes Towing Co. ..... Cleveland.
Midland Towing & Wrecking Co., Ltd. ..... Midland, Ont.
Parker Bros. Co., Ltd. ..... Detroit.

**YACHT AND BOAT BUILDERS.**

Bertram Engine Works Co., Ltd. . Toronto, Can.
Drein, Thos. & Son. ..... Wilmington, Del.
Georgian Bay Engineering Works. ..... Midland, Ont.
Truscott Boat Mfg. Co. ..... St. Joseph, Mich.
Willard, Chas. P. & Co. ..... Chicago.

**YAWLS.**

Drein, Thos. & Son. ..... Wilmington, Del.

# ALPHABETICAL INDEX OF ADVERTISERS IN THE MARINE REVIEW.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.
The dagger (†) indicates that advertisement appears once a month.


*Allen, John F. ..... 3
Almy Water Tube Boiler Co. ..... 42
American Bureau of Shipping ..... 44
American Injector Co. ..... 3
American Line. ..... 39
American Ship Building Co. ..... 5
American Ship Windlass Co. ..... 2
American Steam Gauge Co. ..... 35
Anchor Line. ..... 39
Armstrong Cork Co. ..... 56
Ashton Valve Co. ..... 35
Atlantic Works. ..... 41
†Atlantic Works, Inc. ..... 8

Babcock & Wilcox Co. ..... 8
Baldt Anchor Co. ..... 45
Baker, Howard H., & Co. ..... 56
*Bertram Engine Works Co. Ltd. 41
Blake, Geo. F., Mfg. Co. ..... 45
Boland, J. J. ..... 48
†Bonner & Co., Wm. T. ..... 
*Boston & Lockport Block Co. ..... 35
Boston Steamship Co. ..... 39
Bourne-Fuller Co. ..... 35
Bowers, L. M., & Co. ..... 45
Brown Hoisting Machinery Co. Inc. ..... 2
Buffalo Dredging Co. ..... 46
Buffalo Dry Dock Co. ..... 4

†Camden Anchor-Rockland Machine Co. ..... 
Chase Machine Co. ..... 6
Chicago & Gt. L. Dredge & Dock Co. ..... 46
Chicago Nautical School. ..... 41
Chicago Ship Building Co. ..... 4
Cleveland City Forge & Iron Co. 55
Cleveland & Buffalo Transit Co. 38
Continental Iron Works. ..... 2
Contractors' Supply & Equipment Co. ..... 55
Cory, Chas. & Son. ..... 54
*Craig Ship Building Co. ..... 5
Cramp, Wm. & Sons, S. & E. B. Co. ..... 41
*Crandall & Son, H. I. ..... 3
Crane Co. ..... 43-44

D. & C. Line. ..... 38
Dake Engine Co. ..... 42
Dearborn Drug & Chemical Wks 6
DeGrauw, Aymar & Co. ..... 47
Delauney, Belleville & Co. ..... 35
Delaware River Iron S. B. & E. Works. ..... 41
Detroit Ship Building Co. ..... 5
Dixon Crucible Co., Joseph ..... 54
Donnelly Salvage & Wrecking Co 44
Drein, Thos., & Son ..... 40
Dunbar & Sullivan Dredging Co. 46

Elphicke, C. W., & Co. ..... 48
Erie & Western Trans. Co. ..... 38

Falls Hollow Staybolt Co. ..... 42
Fisher Electrical Works ..... 40
Fitz-Simons & Connell Co. ..... 46
Fix's, S., Sons ..... 54
Fleming & Co., P. H. ..... 48
Fletcher, W. & A., Co. ..... 41
Fogg, M. W. ..... 2
Fore River Shipbuilding Co. ..... 41
Forest City Boiler Co. ..... 54
Frankfort M. A. & P. G. I. Co. ..... 44

General Electric Co. ..... 56
*Georgian Bay Engineering Wks. 41
Gilchrist, Albert J. ..... 48
Gilchrist & Co., C. P. ..... 48
Goodrich Trans. Co. ..... 38
Goulder, Holding & Masten ..... 48
Great Lakes Engineering Works 12
Great Lakes Register ..... 52
*Great Lakes Towing Co. ..... 5

Hall & Root ..... 48
Hanna, M. A., & Co. ..... 47
Hawgood & Co., W. A. ..... 48
Helm & Co., D. T. ..... 48
Hickler Bros. ..... 46
Holmes, Samuel. ..... 48
Holzapfel's American Compositions Co. ..... 45
Hoyt, Dustin & Kelley. ..... 48
Hunt, Robert W., & Co. ..... 40
Hutchinson & Co. ..... 48
Hyde Windlass Co. ..... 56
Hynd, Alexander. ..... 49

International Mercantile Marine Co. ..... 39
Ironville Dock & Coal Co. ..... 47

Jenkins Brothers. ..... 56
Jenks Ship Building Co. ..... 5

Kahnweiler's Sons, David. ..... 40
Katzenstein, L., & Co. ..... 40
Kidd, Joseph. ..... 49
*Kieley & Mueller. ..... 35
Kingsford Foundry & Machine Works. ..... 42
Kreer & Parsons. ..... 49
Kremer, C. E. ..... 48

Lake Superior Contracting & Dredging Co. ..... 46
Lebanon Chain Works. ..... 54
Lester, S. S. ..... 48
Lewis & Hughes. ..... 9
Lockwood Mfg. Co. ..... 41
Lovejoy, H. O. ..... 49
L. S. & M. S. Ry. ..... 55
Lunkenheimer Co. ..... 54

McCarthy, T. R. ..... 48
McCurdy, Geo. L. ..... 44
†McNab & Harlin Mfg. Co. ..... 
Macbeth Iron Co. ..... 56
MacDonald, Ray G. ..... 49
Manitowoc Dry Dock Co. ..... 41
Manitou Steamship Co. ..... 38
Marine Iron Co., Bay City, Mich. 47
*Marine Mfg. & Supply Co. ..... 40
Martin-Barriss Co. ..... 43
Matteson & Drake. ..... 40-49
Mexican-American S. S. Co. ..... 38
Midland Towing & Wrecking Co., Ltd. ..... 55
Mietz, Aug. ..... 6
Milwaukee Dry Dock Co. ..... 4
Mitchell & Co. ..... 48
Morse & Son, A. J. ..... 54
Mosher Water-Tube Boiler Co. ... 43
Motor Boat and Sportsman's Show 43
Moulton Steering Engine Co. ..... 42

Nacey, James. ..... 49
Newport News Ship Building & Dry Dock Co. ..... 7
New Jersey Zinc Co. ..... 6
New York Belting & Packing Co. 3
New York & Cuba Mail S. S. Co. 39
Niagara, St. C. & T. Ry. & N. Co. 38
Northern Mich. Trans. Co. ..... 38
Northwestern Steam Boiler & Mfg. Co. ..... 42

Otis Steel Co. ..... 3

Parker Bros. Co. ..... 48
Pawling & Harnischfeger. ..... 42
Peck, Chas. E. & W. F. ..... 44
*Penberthy Injector Co. ..... 8
Phosphor Bronze Smelting Co., Ltd. ..... 40
Pickands, Mather & Co. ..... 47
Pittsburg Coal Co. ..... 9
Pittsburg Testing Laboratory, Ltd. ..... 49
Potter & Potter. ..... 49
Potter, J. D. ..... 40
Powell, Ambrose V. ..... 49
Prindiville & Co. ..... 48

Record of American & Foreign Shipping. ..... 44
Red Star Line. ..... 39
†Reilly, Repair and Supply Co., Jas., 
Reliance Mfg. Co. ..... 40
Rice, Henry. ..... 49
Richardson, W. C. ..... 48
*Ritchie & Sons, E. S. ..... 47
Roberts Water-Tube Boiler Co. .. 6
Roelker, H. B. ..... 41
Ross Valve Co. ..... 54
Russell & Watson. ..... 45

Sadler, Perkins & Field. ..... 49
Safety Car Heating & Lighting Co. ..... 8
Scherzer Rolling Lift Bridge Co. 45
Schrader's Sons, A. ..... 2
Shaw, Warren, Cady & Oakes. ... 49
*Shelby Steel Tube Co. ..... 8
Sheriffs Mfg. Co. ..... 37
Shipowners' Dry Dock Co. ..... 41
Shipping World. ..... 45
*Smith & Son, Abram. ..... 47
Smith Co., L. P. & J. A. ..... 48
Smith Coal & Dock Co., Stanley B 9
Smith Premier Typewriter Co. ... 45
Smith, Stanley B., & Co. ..... 9
Smooth-On Mfg. Co. ..... 37
†Standard Gauge Mfg. Co. ..... 
*Standard Oil Co. ..... 55
Starke Dredge & Dock Co., C. H. 46
Steel, Adam. ..... 49
Stirling Co. ..... 9
Stratford Oakum Co., Geo. ..... 2
Sturtevant, B. F., Co. ..... 56
Sullivan, M. ..... 47
Sullivan & Co. ..... 48
Superior Ship Building Co. ..... 4

Taylor Water-Tube Boiler Co. ... 43
Thropp, J. E., & Sons Co. ..... 54
Trout, H. G. ..... 37
Truscott Boat Mfg. Co. ..... 40

Union Machine & Boiler Co. ..... 47
United Fruit Co. ..... 38
Upson-Walton Co. ..... 56

Victor Metals Co. ..... 2

Walker, Thomas, & Son. ..... 35
Ward Line. ..... 39
*Watson-Stillman Co. ..... 55
Westinghouse Electric & Mfg. Co. 43
White, Johnson, McCaslin & Cannon. ..... 48
*Willard, Chas. P., & Co. ..... 35
Wood, W. J. ..... 49


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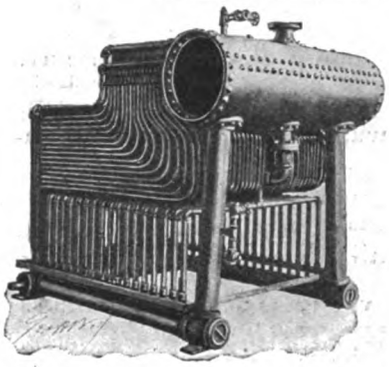

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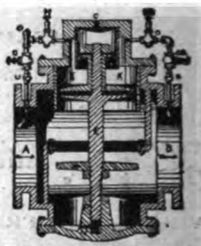

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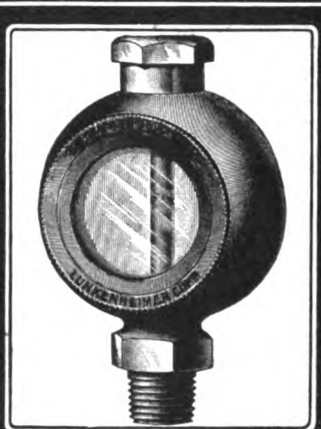

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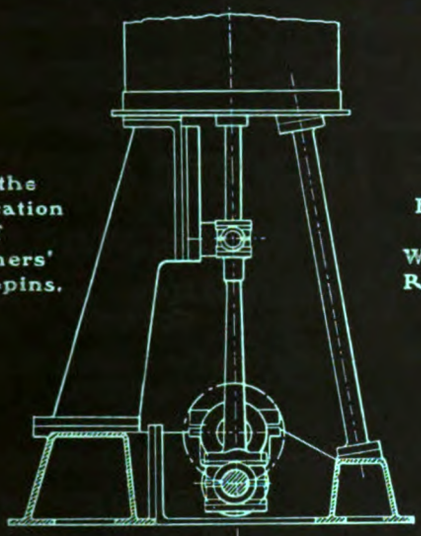

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# LAKE SHORE AND MICHIGAN SOUTHERN RY.

| Eastward | Arrive from West | Depart East |
|---|---|---|
| No. 18, Southwestern Limited | ..... | *1:50 a.m. |
| No. 22, Lake Shore Limited | *2:12 a.m. | *2:20 a.m. |
| No. 20, Chicago and Cleveland Exp. | *7:20 a.m. | ..... |
| No. 28, New York and Boston Exp. | *7:40 a.m. | *8:00 a.m. |
| No. 40, Toledo and Buffalo Accom | †10:00 a.m. | †10:30 a.m. |
| No. 32, Fast Mail | *11:25 a.m. | *11:30 a.m. |
| No. 48, Accommodation via Sandusky | †1:40 p.m. | ..... |
| No. 42, Boston–New York Express | ..... | *11:45 a.m. |
| No. 44, Cleveland and New York Spl | ..... | *3:00 p.m. |
| No. 46, Southwestern Express | ..... | *3:10 p.m. |
| No. 116, Ashtabula Accommodation | ... | †4:30 p.m. |
| No. 6, Limited Fast Mail | *5:40 p.m. | *5:45 p.m. |
| No. 26, 20th Century Limited | *7:40 p.m. | *7:43 p.m. |
| No. 10, Chicago, N.Y. & Boston Spl. | *7:30 p.m. | *7:50 p.m. |
| No. 16, New England Express | *10:30 p.m. | *10:35 p.m. |
| No. 2, Day Express | †9:10 p.m. | †9:25 p.m. |
| No. 126, Norwalk Accommodation | †7:55 a.m. | ... |

| Westward | Arrive from East | Depart West |
|---|---|---|
| No. 7, Exposition Limited | *12:50 a.m. | ..... |
| No. 11, Southwestern Limited | *2:55 a.m. | ..... |
| No 9, Day Express | ..... | †6:10 a m. |
| No. 15, Boston and Chicago Special | *3:10 a.m. | *3:15 a.m. |
| No. 19, Lake Shore Limited | *7:15 a.m. | *7:25 a.m. |
| No. 23, Western Express | *10:30 a.m. | *10:35 a m. |
| No. 29, Southwestern Special | ‡11:10 a.m. | ..... |
| No. 33, Southwestern Express | *12:25 p.m. | ..... |
| No. 133, Cleve and and Detroit Exp. | ..... | *12:45 p.m. |
| No. 47, Accommodation | †11:00 a.m. | †3:00 p m. |
| No. 141, Sandusky Accommodation | ..... | †3:10 p m. |
| No. 43, Fast Mail | *4:35 p.m. | *4:40 p.m. |
| No. 127, Norwalk Accommodation | ..... | †5:10 p.m. |
| No. 37, Pacific Express | *6:50 p.m. | *7:20 p m. |
| No. 3, Fast Mail Limited | *10.50 p.m. | *10:55 p.m. |
| No 115, Ashtabula Accommodation | *8.30 a.m. | ..... |

*Daily. †Except Sunday. ‡Except Monday.
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# STURTEVANT
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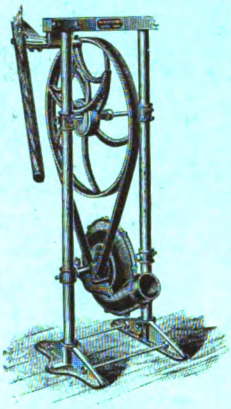

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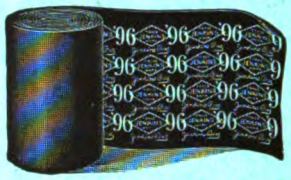
TIME and Steam cost money. Leaky steam joints waste them fast. JENKINS '96 PACKING---which is absolutely guaranteed---saves both.

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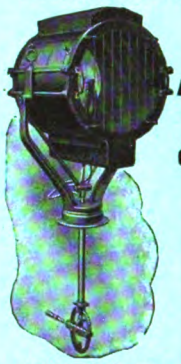

18 inch Projector. Pilot House Control.

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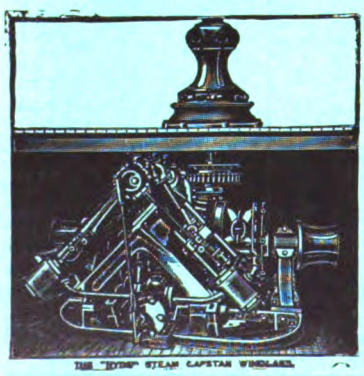
## WINDLASSES AND CAPSTANS



The Hyde Steam and Power Windlasses and Capstans are the best in the market.

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